The BEGINNING TELEGRAPHER

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The

BEGINNING TELEGRAPHER

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BY
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E. M. ROBERTS

PREFACE

In compiling this work, the writer has endeavored to keep in mind, that this book, true to its name, "The Beginning Telegrapher," is to be used by students, and the uninitiated class of Telegraphers. He has tried to be as brief and concise as possible, at the same time using language that is simple and comprehensive.

Great care has been taken in arranging this work, step by step, so as not to tax the mind of the student, with but one thing at a time. Each lesson has been arranged in the order in which it should come.

In compiling this text, the writer has been guided and directed by his wide and varied experience as a Railroad and Commercial Telegrapher, and has endeavored to present the subject matter much in the same manner as he has taught it successfully for the past seventeen years. He has hundreds of successful graduates, working on practically every Railroad in the United States and Canada and with the various Commercial Telegraph Companies.

The writer has taken into consideration that inasmuch as every student is expected to start at the bottom, that it would be useless to embody in this work, many things that can only be learned by years of experience.

Each student is earnestly enjoined to study carefully in addition to this work, the book of rules which is published by the Railroad Company, or the Commercial Company for which he intends to work.

E. M. ROBERTS.

LESSON I

THE MORSE ALPHABET

The Morse Alphabet is composed of dots, dashes and spaces.

The letter A is represented by a dot and a dash, (·–) ; B by a dash and three dots, (–···) ; while the letter C is represented by two dots, a space and a dot, (·· ·) ; thus in the first three letters we have the dots, the dashes and the spaces.

The letter L and the cipher 0 are each represented by a long dash. The dash for the letter L being almost twice as long as the ordinary dash, and the dash for the cipher 0 just a little longer than the one for the letter L.

The student should first memorize the characters that represent the letters as given below, until they can tell what characters represent each letter rapidly, without looking at the book.

A	B	C	D	E	F	G
·–	–···	·· ·	–··	·	··–·	––·
H	**I**	**J**	**K**	**L**	**M**	**N**
····	··	·––·	–·–	——	––	–·
O	**P**	**Q**	**R**	**S**	**T**	**U**
· ·	·····	··–·	· ··	···	–	··–
V	**W**	**X**	**Y**	**Z**	**&**	
···–	·––	·––·	·· ··	··· ·	· ···	

After the student is able to write or call what characters represent each letter, in the order in which they come without looking at the book, he should translate the following words into Morse characters. This will help him to so familiarize

himself with the alphabet that he will be able to skip around, and help him to get out of the habit of merely being able to call them in rotation.

Translate the following words into Morse Characters:

Abstract
Accurate
Addition
Amount
Analysis
Analyze
Arithmetic
Answer
Area
Average
Bankrupt
Barrel
Basis
Bushel
Calculate
Capacity
Cipher
Complex
Concrete
Decimal
Digit
Discount
Dividend
Division
Dollar
Equation
Equator
Equivalent
Example
Exponent
Extract
Fathom
Fraction
Gross
Gauge
Halve
Insurance
Interest
Juniper
Judgment
Majority
Measure
Maximum
Naught
Notation
Numeral
Object
Obstruct
Ornament
Problem
Proceeds
Product
Quantity
Quotient
Quality
Ratio
Reckon
Revenue
Reduction
Separate
Subtract
Solution
Thousand
Twine
Trowel
Under
Unit
Vacate
Voice
Vase
Water
Whirl
Wagon
Weird
Xylophone
Yacht
Yourself
Young
Zinc
Zebra

After having translated the preceding words into Morse characters, the student should be able to tell readily what characters represent a certain letter as soon as the letter is called.

It now becomes necessary to think quickly what

letter the different characters represent as soon as the characters are made or called.

We will soon begin to make the characters on the instrument, we must then be able to think instantly what letter each character or characters represent. To help the student in this manner, we have outlined a number of words in the Morse for the student to translate into English.

Translate the following:

1. .– .. . . –.. . –. –
2. .– –... .– –. –.. . . –.
3. –... .– ––. ––. .– ––. .
4. –... .– .. . . — . . . ..
5. .. . .– –... . . . .
6. .. . .. –. –.. . . ..
7. –.. . ...– – .. ..
8. –.. . ... –
9. . .–.. .... –
10. . .–.. .. . .– –. ––. .
11. .–. .– . .. –– . . ..
12. .–. . .. .– –. .. . .
13. ––. .– . .. –.. . –.
14. .... ..– –– .– –.
15. ––. — .– .. . .
16. .... .– –– –– . . ..
17. .. .. . . –... . . .. ––.
18. .. –. ... .
19. –.–. ..– –. .. . – .. . . –.

20. −·−· · · · ····· ·− · ·· −·· ·· ··
21. −·− ·− −· −−· ·− · ·· · · · ·
22. −·− −· · · ·−− — · −·· −−· ·
23. — ·− −· − · · ·· −·
24. — · ·− · ·· −·
25. −− · · ·−· −· − ·− ·· −·
26. −− ·− · ·· −··· — ·
27. −· · ···− · · ··
28. −· ·− · ·· · ·· ·− − ·
29. · · −··· ··· ·· · ·−· · ·· ·
30. · · −··· — ·· ·−·· ·−· ·
31. ····· · · ····· ·−· — ·− − ·· · · −·
32. ····· ·− · ·· − ·· ·· · ·−· — ·− · ··
33. ··−· ·−· · ··· − ·· · · −·
34. · ·· ·− −· ·· · ·· −··
35. ··−· ·−· ·− −· − ·· − ·· ··
36. · ·· · · ·−· −−· ····
37. ··· − ·−· −− −··· — ·
38. ··· ·−· · ·· ····· · ·· ·· ··· ·
39. − ·− −··· — ·
40. − ·−· · ·· −· ·· −· −−·
41. ·−· −· ·· ·−·· ·−· ·
42. ·−· −· − ·· · −··
43. ···− ·− ··· ·
44. ···− ·− · ·· ·· · − ·· ··
45. ·−− ·− −−· · · −·
46. ·−− ···· · · ·· · ·−· · · · ·· ·

47. .–.. .. .. — . . ––. . .. .– ....

48. .–.. .– –. – .... .. –. .

49. .. .. . .– . ..

50. .. ..– –. ––.

51. ... . . .– — . . ..– ...

52. ... .

After translating the foregoing words into English the student should KNOW the alphabet thoroughly, and be able to say instantly what letter each character or characters represent.

We are now ready to take up sending or making the characters with the key, which will be explained in the next lesson.

LESSON II

INSTRUMENTS EMPLOYED FOR PRACTICE

For practice the student will need an ordinary key and sounder and two dry cell batteries.

The key is a mechanical device for opening and closing the circuit, thus causing the characters to be formed on the sounder.

The principal features of the key are: A metallic lever on a trunion supported by screws in the elevated sides of a metallic base. On the bottom of this base are two metallic screw posts to receive the ends of the wires. One post is separated from the other by non-conducting material—generally vulcanized rubber—which runs around the point in the front part of the key. In the center of this is fastened a small piece of platinum, and directly above this on the under side of the key lever is fixed another piece of the same metal.

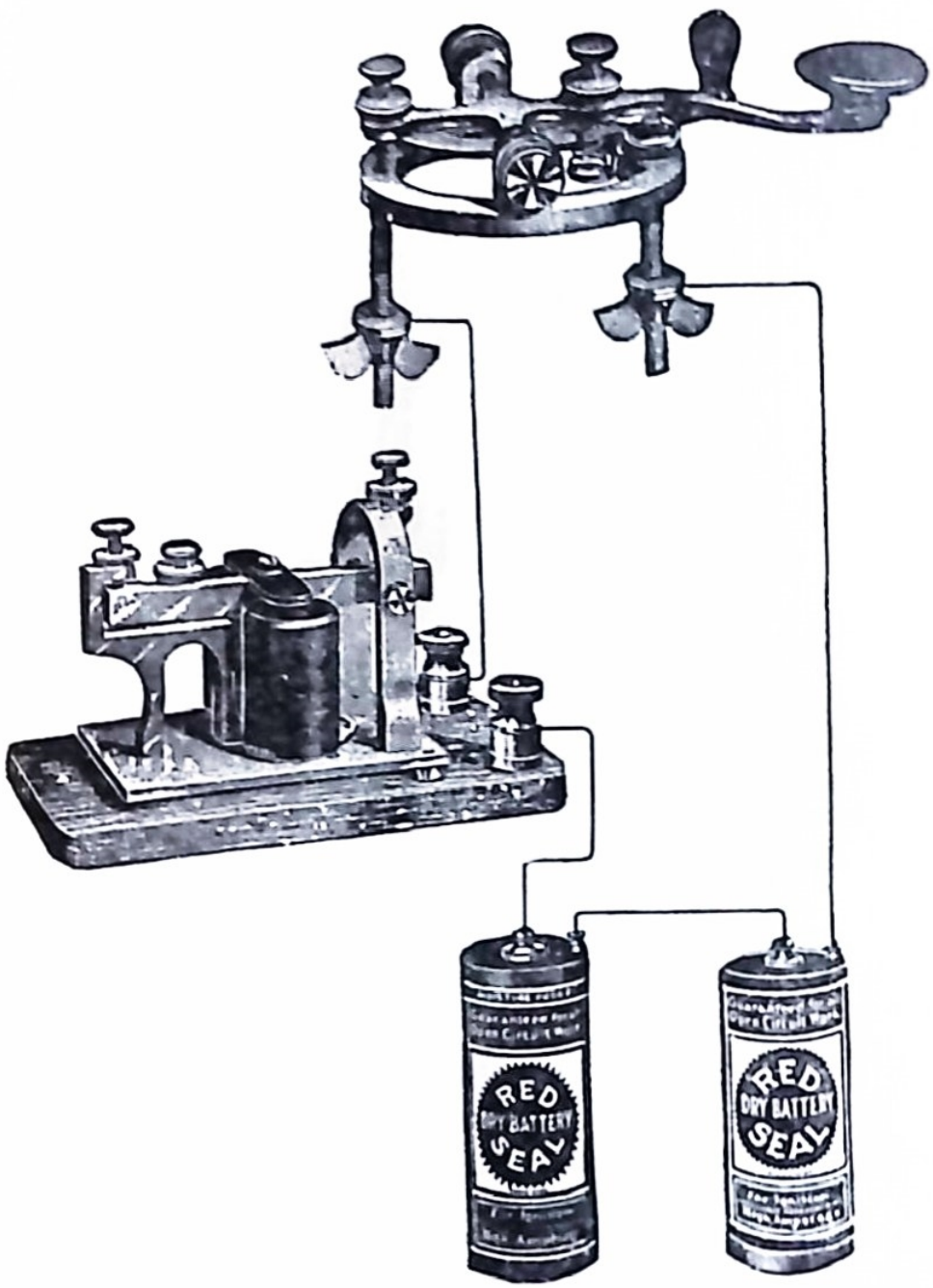
One being insulated from the other, the current cannot pass between them, except while the lever is pressed down, bringing together the two platinum points, which are really the two ends of the wire. A spring is employed under the key lever to keep these two points separated.

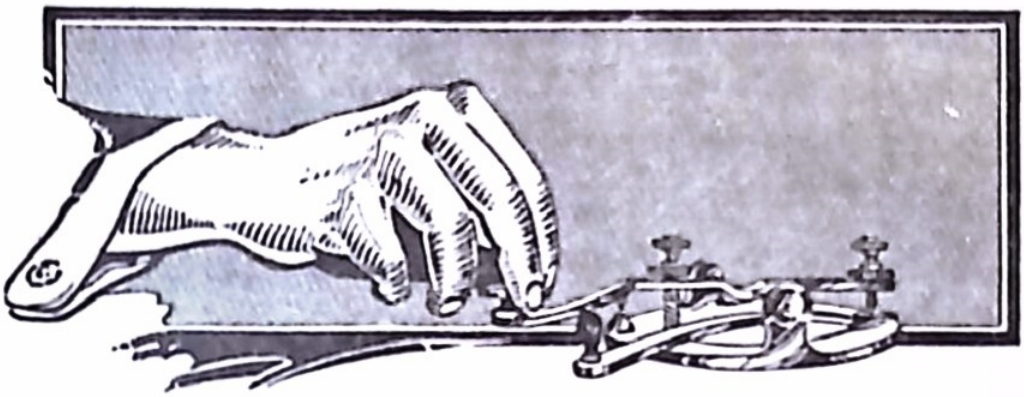
The circuit is kept closed by a circuit closer or movable bar, which slides under a lip, thus keeping the wire electrically connected when the key is not in use. This circuit breaker should be removed from practice sets when dry cell batteries are employed, for if the circuit remains closed, it would soon wear out the battery.

The sounder is the instrument employed in receiving the characters which are formed by the opening and closing of the key. It consists of two upright electro magnets, an iron armature attached to a movable lever fixed upon a frame elevated above the base and a spring attached to the lever which must be adjusted in proportion to the strength of the batteries. It is regulated by two adjusting screws, one stopping the movement toward the magnets which gives the sound, the other limiting the movement of the lever away from the magnet by the spring.

To connect up a set of instruments for practice, first drill two holes in your table about eighteen inches from the edge to receive the legs of the key, next firmly screw the sounder to the table a short distance from the key and when dry cell batteries are employed, they are usually placed on the floor under the table, in a drawer under the table or in some other convenient place. Now simply run a wire from the back leg of the key to one of the binding posts on the sounder, then from the other binding post of the sounder to the outside or negative pole of one of the batteries, then from the center pole of

that battery to the outside pole of the other battery, and from the center pole of the second battery to the front leg of the key. A diagram showing how to connect a set of instruments for practice is herewith shown.





SENDING

Take an easy comfortable position at the table. Place the first two fingers on the key button, over toward the farther side, on top, with the thumb just under the edge, curve the third and fourth fingers so that they do not touch the table but not enough to cramp them, let the elbow rest on the table, with the wrist up from the table about an inch or inch and one-half. The motion should be from the wrist and forearm, avoiding all side pressure. Do not grip the key but allow the fingers to rest upon it lightly at all times, never allow the fingers to leave the key while sending, nor the elbow to leave the table.

A dot is made by a quick downward stroke of the key, letting it come up as quickly as the contact is made. A dash is made by holding the key down as long as it would take to make three dots, or as long as it would take to count three. The long dash as in the letter L and the cipher 0, should be held as long as it would take to make five and six dots respectively. The beginner should never cut the dashes short,

to do so will make receiving much harder. The space is made by leaving a space between dots about as long as it would take to say the word space.

1. Learn the movement first on dots, making one each second until you have made about twenty dots, being careful that each dot is made by a distinct motion of the wrist, stop and rest a moment, then try it again this time making two each second, then three each second, keeping this up and getting a little faster each time, until finally a speed of about two hundred and fifty per minute is attained, always being sure that each dot is made by a distinct motion of the wrist.

2. As soon as the student has reached a speed of 250 per minute he may now practice the first exercise given below.

e	i	s	h	p	6
.	..	...	....	.....	.....

3. When the student has mastered the foregoing dot exercise he should now try the dash exercise given below, being sure to hold the ordinary dash as in the letter T, three times as long as the dot, the letter L, five times as long as the dot and the cipher 0 six times as long as the dot, never cutting the dashes short, and always being sure to use the wrist.

t	m	5	l	0
–	––	–––	——	———

4. Next take up the space letters. As explained above the space between dots in space letters, should be about as long as it would take to say the word space, thus in the letter O, make a dot, say space and make another dot, in C make two dots, say space

and make another dot, etc. Practice the space letters carefully.

o	r	c	y	z	&
. .	. ..	.. .	.. ..	... .	. ...

5. Now take up the dot and dash combinations. In making the letter A, (.–), make it as if you were going to make two dots, and hold the second one down three times as long as you do the first one, the letter U, as if you were going to make three dots, holding the third one down the length of a dash, and the letter V, as if you were going to make four dots, holding the last one down, etc. This will help you to join the dots and dashes more closely, practice the following combination carefully.

a	u	v	4	n	d	b	8
.–	..–	...–	....–	–.	–..	–...	–....

6. When the student has mastered all the foregoing exercises, he should now turn back to the alphabet on page 4 and start in with the letter A making it fifteen or twenty times, very carefully and when the student feels that he is making the letter A, absolutely correct, he should then stop and make dots for about one minute, always being sure to use the wrist and forearm movement. Next take the letter B, making it fifteen or twenty times carefully, following it with the dots for one minute, then C followed by the dots and so on through the entire alphabet. When the student has worked this exercise out carefully, he should be making the alphabet correctly.

7. Now turn back to the words on page 5 and spell each one out carefully on the key, calling each letter as it is made and after the last letter of the

word, call the last letter and the word. This will help the student to gain uniform spacing and should be followed out at all times, when sending for practice from a newspaper or other printed matter.

HINTS IN SENDING

Work for accuracy, not for speed. If accuracy is gained speed will come with practice. The beginning student should never try to send faster than he can receive. This rule if carefully followed out will eventually make a good sender. To be able to send good, plain, clear cut Morse, should be a student's greatest desire. When the student is able to send firmly, smoothly and accurately, he will find that it also aids him in receiving, so from the very beginning, make each letter, each figure, absolutely correct.

Practice carefully the following sentences.

The five boxing wizards jump quickly.

We dislike to exchange job lots of sizes varying from a quarter up.

Probably my oxen will haul a dozen loads of gravel just as quickly.

The job requires extra pluck and zeal from every wage earner.

Whenever the black fox jumped the squirrel gazed suspiciously.

We quickly shipped the peppers up the upper Mississippi River prepaid.

LESSON III

RECEIVING

After all of the letters have been thoroughly memorized and the student is able to make each one correctly on the key, receiving may be taken up. The student should take a position near the sounder, with the instructor at the key. The student should not watch the sender's hand, nor should he watch the sounder. He should learn to read the characters by sound as they are made, from the very beginning.

The instructor, or person who is sending, should make the letters, with the key, slowly and distinctly, allowing the student to call each letter and write it down as made. If sending from a book, newspaper or other press matter, the student should call the letters and the person who is sending, call the words as they are completed. This practice should be kept up until the student is able to call the letters and write each down as rapidly as the sender can send them.

The receiving of words may now be taken up. The person sending, should send each letter slowly, allowing the student to write down each letter as sent, at the end of the word the sender should stop and allow the student to call the word. This practice should be kept up until a speed of twelve or fifteen words per minute is reached, counting five letters to the word, the student calling the words and writing them down as sent.

The practice of calling the words may now be discontinued. The sender should now begin sending straight press matter at a speed which is about one-fourth faster than the student can copy. This will tend to increase the speed of the student as he has to continually *reach out*, endeavoring to get all that is being sent and this will also help the student to

form the habit of copying behind, which habit is invaluable to all classes of Telegraphers. The student should try from the time he quits calling the words, to copy first a letter or two behind, then a word behind, and finally two or three words behind the sender.

The student should write down each word, each letter, as clearly and neatly as possible, striving each day to make his penmanship, more legible and better. A good clear, legible handwriting is one of the most essential things for a Telegrapher. The student should bear in mind that when he becomes a finished telegrapher, holding a responsible position, that his penmanship must be handed out to others to be read, sometimes under unfavorable conditions, so the student should put in much practice on his penmanship. Good penmanship is just as essential to a telegrapher as learning to send and receive.

LESSON IV

NUMERALS

As soon as the student is able to call his letters, rapidly as made on the instrument, he should now memorize the numerals and begin to send and receive them. The numerals are used just as much in Telegraphy as the letters and the student should become just as efficient in their use. The reason for not introducing them before was so that the student would not have to tax his mind more than necessary, by having so many characters to memorize at the beginning. Below are given the numerals. Memorize them as well as you did the letters at the beginning.

Numerals

1	2	3	4	5
·−−−·	··−−·	···−·	····−	·····
6	7	8	9	0
−····	−−···	−−−··	−−−·−	−−−−−

After memorizing the above numerals, practice carefully on the key, the exercises given below.

27	182	9671	56542	312981	8796543
35	391	3119	38912	406922	2371802
64	607	2135	71846	389420	5768942
78	296	4327	32916	678142	1785348
39	781	8212	79781	318243	2976514
14	436	7961	23201	296521	1086573
96	212	1461	40102	338124	2468913
81	314	1231	96912	438121	1931425

LESSON V

PUNCTUATIONS

When the student has reached a point where he is able to send and receive both letters and figures rapidly, it will now be well to take up the punctuation marks and thoroughly memorize them. This will probably take some little time as there are a number of punctuation marks. The student should persevere however until he can use them all readily. We will endeavor to give those most commonly used first, etc.

Punctuation Marks			Made as
Period	.	..—..	ud
Comma	,	.—.—	aa
Interrogation	?	—..—.	tq
Dollars	$	... .—..	sx
Semicolon	;	... ..	si
Dash	—	—.. .—..	dx
Paragraph	¶	——	mm
Capitals		.. . .—..	cx
Decimal point	.	—.. . . —	dot
Cents	¢	.. .	c
Colon	:	—.— . .	ko
Colon dash	:—	—.— .—..	kx
Colon quotation	:”	—.— ..—.	kq
Hyphen	-	.... .—..	hx
Beg. quotation	“	..—. —.	qn
End. quotation	”	..—. —.—.	qj
Apostrophe	’	..—. .—..	qx
Brackets	[]	—... .—..	bx
Beg. parenthesis	(	..... —.	pn
End. parenthesis	)	....	py
Pound sterling	£	..... .—..	px
Shilling	s	..—	im
Pence	d	—..	d

The student will probably find it easier to remember the punctuation marks by the letter combinations used in forming them viz: period ud, comma aa, etc.

Punctuation Marks Explained

Punctuation marks are not always used on the wire as they would appear in print, or as they should be used. The period is very seldom used except at the beginning of the body of a message or train order. The comma is perhaps most used and con-

veys several meanings according to where it is placed. Take for instance, after the first line of the address of a message has been sent, it is used and means, "drop a line," as per example:

Henry J Adams,
Chillicothe Mo.

The interrogation mark is the most useful of all the punctuation marks. Its uses are many and varied. If the sending operator starts to send a word and makes a mistake, he sends an interrogation mark and starts the word over again, thus conveying the meaning to the receiving operator that he has made a mistake and wishes to correct it, again it is used when the receiving operator is not getting what is being sent, and means the same as: "I did not get you please repeat," and is also used in its proper sense, after a question has been sent.

The dollar mark is sent preceding figures when wishing to express the number of dollars in numerals; i. e., fourteen dollars would be sent as follows: sx 14.

For the decimal point, the word d o t is spelled out. Say for example, the sending operator wishes to send fourteen dollars and twenty-five cents in numerals, he would send it as follows: sx 14 dot 25.

Fractions are sent by placing the letter e between the numerator and the denominator. For example, one-half would be sent : 1 e 2.

Numbers containing two or more ciphers are sent in the following manner: one hundred, 1 hnd; one thousand, 1 tnd; one million, 1 myn; etc. This eliminates sending so many ciphers.

All punctuation marks should be sent at about twice the speed of ordinary transmission, this eliminates the danger of confusing the punctuation marks with the words. Punctuation marks are not sent after initials or abbreviations.

LESSON VI

ABBREVIATIONS

In wire conversation it is necessary to be brief, as it would take too much time to spell every thing out in plain English. We are giving herewith a list of abbreviations commonly used in wire conversation. The student should memorize these carefully and should practice them dilligently as they are very important and no good operator can afford to be without them. The conversation on Railroad wires especially is nearly all abbreviated.

Abandoned—Abnded
About—Abt
Abbreviations—Abbn
Acknowledge—X (used in train orders only)
Account—Acct
Action—Actn
Address—Ads
Afternoon—P. M.
Agent—Agt
All Right—Art
Always—Alwas
Amount—Amt
And others—"et al"
Annulled—Annld
Another—Anr or Ahr
Answer—Ans
Any—Ay
Anything—Aytng or 5
April—Apl or Apr
Are—R
Arrived, or Arrive—A
Ascertain—Ascrtn
Assist, or Assistant—Asst
Assistant General Freight Agent—A G F A
Assistant General Passenger Agent—A G P A
Attention—Attn
Attorney—Atty
August—Aug
Avenue—Ave

Be—B
Block—"B" used in block system only
Back—Bk
Baggage—Bage
Barrel—Bbl or Brl
Battery—Baty
Become or Became—Becm
Been—Bn
Before—B4
Better—Btr
Between—Betwn
Bill of Lading—"BL"
Black—Blk

Blanks—Blnx
Block—Blk
Board—Bd
Body—Bdy
Book—Buk
Bought—Bot
Boulevard—Blvd
Bound—Bnd
Break—Brk
Brakeman—Brkmn
Building—Bldg
Bushel—Bu
Business—Biz
But—Bt
By—Bi

Can—Cn
Cancel former Order—C F O
Cannot—Cant
Cashier—Cashr
Cent—Ct
Charge—Chg
Check—Ck
Chief—Chf
Circuit—Ckt
Clear—Clr
Coal and water—C & W
Collect—Coll
Collect on delivery—C O D
Combination—Combn
Come, or Came—Cm
Coming—Cmg
Commercial—Coml
Commercial News Department—C N D
Commission—Comsn
Company—Co
Complete—Comp or "CM"
Compliments—73
Conductor—Condr
Conductor and Engineer—C & E
Connection—Conctn
Copy—Cy
Correct—OK
Correction—"Corn" used only as a wire signal
Cost Insurance and Freight—"C I & F"
Could—Cld
Creditor—Cr
Crossing—Xng

Day—Da
Day press rate—D p r
Dead Head—D H
Debtor—Dr
December—Dec
Decrease—Dec
Democrat—Dem
Deliver—92
Delivery—Dely
Depart, or Departed—"D"
Dispatcher—Dispr
Destroy—Bust
Did—Dd
Double Deck—DD
Delivery charges guaranteed—Dely chgs gtd
Difference—Dif
Dinner—Dinr

Disregard former service —D F S
District—Dist
Division—Div or Divn
Don't—Dnt
Doubt—Dbt
Down—Dwn
Dozen—Doz
Draft—Dft
Duplicate—Dup

East—E
Election—Electn
Empty—Em or mt
Engine—Eng
Engineer—Engr
Enough—Enuf
Errors excepted—Ee
Errors and omissions excepted—"e & oe"
Every—Evy
Excursion—Excn
Excuse—Ex
Express—Ex
Extra—Exa or xtra

Favor—Fvr
February—Feb
Few—Fu
For—R
Foreign—Forgn
Forward—Fwd
Free on Board—F O B
Freight—Frt
From—Fm or Fr
Foreman—4 man

General Baggage Agent —G B A
General Freight Agent— G F A
General Passenger Agent —G P A
Get—Gt
Give Better Address— G B A
Give Some Address— G S A
Go Ahead—G A
Go Ahead Arrival— G A A
Go Ahead Departure— G A D
Going—Gg
Gone—Gn
Good—Gd
Good Afternoon—P M
Good Evening—G E
Good Morning— GM
Good Night—G N
Gossip—"Guff"
Got—Gt
Government—Govt
Grain—Grn
Great—Grt
Ground—Gnd
Ground Wire—G W
Guaranteed—Gtd
Guess—Gs

Half—Hf
Has—Hs
Have—Hv
Hear, or Here—Hr
High—Hi

How—Hw
Hogshead—H H D
How is—Hws
Hundred—Hnd
Hundred weight—Cwt

Immediately—Immy
Important—Impt or 55
Increase—Inc
Instrument—Instmnt
Invoice—Inv

January—Jan
Junction—Jct or Junc
Junior—Jr

Knew—Nu
Know—No
Knows—Nos

Last Month—Ult
Laugh—Ha ha
Learn—Lrn
Leave—Lv
Letter—Ltr
Light—Lite
Loads—Lds
Local—Loc
Look—Luk
Loop—Lup
Low—Lo
Limited—Ltd

Made—Md
Main—Mn
Majority—Maj
Make—Mk
Manager—Mgr
Manifold—Mfld
Manifest—Mfst
Manufacturer—Mfr
Manufacturing—Mfg
Many—Mny
March—Mar
Marked—Mkd
Market—Mkt
Matter—Mtr
May—Ma
Merchandise—Mdse
Message—Msg
Messenger—Msgr
Might—Mite
Mile—Mi
(Mill) typewriter
Million—Mln or Myn
Minute—Min
Mistake—Msk or Bull
Mistaken—Mskn
Misses—Mrs
Mister—Mr
Months—Mos
More—Mo or Mr
Morning—Mng or A M
Much—Mch

Namely—Viz
Near—Nr
Necessary—Necy
Night—Nite—(Red)
Night Press Rate—N p r
None Between—N b
North—N
Not—Nt
Nothing—Ntg
Never—Nvr
New—Nu

Next Month—Prox
November—Nov
Now—Nw
No More—Nm
No such number—N S N
Number—No

Obedient—Obt
Obtain—Obtn
O'clock—K
October—Oct
Of—O
Office—Ofs
One Hundred—1 hnd
One Thousand—1 tnd
O K—Correct
On time—Ot
Opening—Opg
Operator—Opr
Opinion—Opn
Order—Ord
O S—All offices take notice or Order Sheet
Other—Otr
Our—R
"Out"—(of no account)
Out—Ot
Owners risk—"O R"

Package—Pkg
Paid—Pd
Pair—Pr
Passenger—Pasgr
Pay—Pa
Payment—Payt
People—Peo
Pecks—Pks
Pink—(Rush)
Pint—Pt
Please—Pls
Pounds—Lb
Post Office—P O
Precinct—Prct
Preferred—Pfd
Present Month—Inst
President—Prest or Pt
Principal—Prin
Prohibition—Pro

Quick—Qk
Quotation—Qtn or Tick

Railroad—R R
Railway—Ry
Ready—Rdy
Rebate—Reb
Receipts—Rects
Received—Recd
Receiving—Recg
Red—(Nite)
Refrigerator—Refr
Release—"Rel"
Relay—Rela
Relief—Rj
Repeat—Rept
Report—Rept
Report delivery charges—Rept dely chgs
Republican—Repn
Right—Rite
Roast—a great number
Round—Rnd
Rush—(Pink)

Said—Sd
Same—Sm

Say—Sa
Second—Sec
Section—Secn
See—C
See former order—S F O
See former service—S F S
Seen—Cn
See your service—S Y S
Single deck—S D
Sir—Sr
Slow—Slo
Service—Svc
Several—Svl
Should—Shld
Siding—Sdg
Sight—Site
Sign—Sine
Signature—Sig
Signed—Sined or Sgd
Station—Stn or Sta
Stay—Sta
Stock—Stx or Stk
Somehow—Smhw
Some one—Sm 1
Something—Smtng
Somewhat—Smwt
Somewhere—Smwr
Soon—Sun
South—S
Speak—Spk
Special—Spl
Special delivery guaranteed—Spl dely gtd
Sending—Sendg
September—Sept
Stop for breakfast—Sfb
Stop for dinner—Sfd
Stop for night—Sfn
Stop for tea—Sft
Straight—Strate
Street—St
Superintendent—Supt
Supper—Supr
Suppose—Spose
Switch—Sw
System—Sys

Take—Tk
Talk—Tlk
Tariff—Tf
Telegraph—Tel
Telephone—Fone or Phone
Thanks—Tnx
That—Tt
That is—Tts or "i. e."
The—T
Their—Tr
Them—Em
Then—Tn
There—Tr
They—Ty
Thing—Tng
This—Ts
This morning—Tsmng or Ts A M
Though—Tho
Thought—Thot
Thousand—Tnd
Through—Thru or Tru
Tierce—Tc
Today—Toda
Together—Togtr
Tomorrow—Tomw
Tonight—Tonite

Took—Tuk
Tough—Tuf
Track—Trk
Train—Trn
Transfer—Tfr
Traveling Passenger Agent—T P A
Try—Tri
Typewriter—(Mill)

Unchanged—Unchgd
Undelivered—Undeld
Understand—13
Underline—UX

Versus—"vs"
Very—Vy

Was—Ws
Water—Wtr
Way—Wa
Way Bill—"W B"
Weather—Wtr
West—W
Wharf—Whf
What—Wt or ?
When—Wn
Where—Wr
While—Wile
Why—Wi
Who—Wo
Will—Wi
With—Wi
Word—Wd or W
Worked—Wkd
Would—Wld
Write—Rite
Wrote—Rote
Wrong—Wng

"X" acknowledge (used in train orders only)
"XU"—Answer by wire, (used in commercial telegrams only)

Yard—Yd
Yards—Yds
Yes—Es
Year—Yr
Years—Yrs
Yesterday—Esterda
Yet—Et
You—U
Young—Ung
Your—Ur
Yes Sir—Esr

NUMERAL WIRE SIGNALS

There are a few simple sentences that are used for which figures have been substituted, as by their use much time is saved. Some impart special information, while others serve to ask a question or furnish an answer. There is a difference to some extent in their meaning on different lines, but the following are more or less commonly used.

1. Wait a minute.
2. Very important.

3. Train reports, or O. S.
4. Where shall I go ahead?
5. Have you any business for me?
7. Are you ready?
8. Close your key, you are breaking.
9. Clear the line for Train Orders.
12. Do you understand?
13. I understand.
18. What is the trouble?
19. Train Orders.
23. Accident or death message.
25. Busy on another wire.
30. The End.
31. Train Orders.
33. Answer paid for.
34. Message for all offices.
73. Accept my compliments.
92. Deliver quick.
134. Who is at the key?

LESSON VII

BEGINNING RAILROAD TELEGRAPHY

GENERAL NOTICE

Safety is of the first importance in the discharge of duty.

Obedience to the rules is essential to safety.

To enter or remain in the service is an assurance of willingness to obey the rules.

The service demands the faithful, intelligent and courteous discharge of duty.

To obtain promotion capacity must be shown for greater responsibility.

GENERAL RULES

A. Employes whose duties are prescribed by these rules must provide themselves with a copy.

Employes whose duties are in any way affected by the time-table must have a copy of the current time-table with them while on duty.

B. Employes must be conversant with and obey the rules and special instructions. If in doubt as to their meaning they must apply to proper authority for an explanation.

C. Employes must pass the required examinations.

D. Persons employed in any service on trains are subject to the rules and special instructions.

E. Employes must render every assistance in their power in carrying out the rules and special instructions and must report to the proper official any violation thereof.

F. Accidents, detention of trains, failure in the supply of water or fuel, or defects in the track, bridges or signals must be promptly reported by wire to the proper official.

G. The use of intoxicants by employes while on duty is prohibited. Their use, or the frequenting of places where they are sold is sufficient cause for dismissal.

H. The use of tobacco by employes while on duty in or about passenger stations, or on passenger cars is prohibited.

I. Employes on duty must wear the prescribed badge and uniform and be neat in appearance.

J. Employes and others authorized to transact business at stations or on or about trains must be orderly and avoid annoyance to patrons.

K. In case of danger to the Company's property employes must unite to protect it.

DEFINITIONS

Engine—A locomotive propelled by any form of energy.

Motor—A car propelled by any form of energy.

Train—An engine, or motor, or more than one engine, or motor, coupled, with or without cars, displaying markers.

Regular Train—A train authorized by a time-table schedule.

Section—One of two or more trains running on the same schedule displaying signals or for which signals are displayed.

Extra Train—A train not authorized by a time-table schedule. It may be designated as:

Extra—For any extra train, except work extra.

Work Extra—For work train extra.

Superior Train—A train having precedence over another train.

Train of Superior Right—A train given precedence by train order.

Train of Superior Class—A train given precedence by time-table.

Train of Superior Direction—A train given precedence in the direction specified by time-table as between opposing trains of the same class.

Time-Table—The authority for the movement of regular trains subject to the rules. It contains the classified schedules of trains with special instructions relating thereto.

Schedule—That part of a time-table which prescribes class, direction, number and movement for a regular train.

Division—That portion of a railroad assigned to the supervision of a Superintendent.

Subdivision—A portion of a division designated by time-table.

Main Track—A track extending through yards and between stations, upon which trains are operated by time-table or train order, or both, or the use of which is governed by block signals.

Single Track—A main track upon which trains are operated in both directions.

Double Track—Two main tracks, upon one of which the current of traffic is in a specified direction, and upon the other in the opposite direction.

Three or More Tracks—Three or more main tracks, upon any of which the current of traffic may be in either specified direction.

Current of Traffic—The movement of trains on a main track, in one direction, specified by the rules.

Station—A place designated on the time-table by name at which a train may stop for traffic; or to enter or leave the main track; or from which fixed signals are operated.

Siding—A track auxiliary to the main track for meeting or passing trains.

Fixed Signal—A signal of fixed location indicating a condition affecting the movement of a train.

Note to Definition of Fixed Signal—The definition of a "Fixed Signal" covers such signals as slow boards, stop board, yard limits, switch, train order, block, interlocking, semaphore, disc, ball or other means for displaying indications that govern the movement of a train.

Yard—A system of tracks within defined limits provided for the making up of trains, storing of cars and other purposes, over which movements not authorized by time-table, or by train order, may be made, subject to prescribed signals and rules, or special instructions.

Yard Engine—An engine assigned to yard service and working within yard limits.

Pilot—An employe assigned to a train when the engineman or conductor, or both, are not fully acquainted with the physical characteristics or rules of the railroad, or portion of the railroad, over which the train is to be moved.

Train Register—A book or form which may be used at designated stations for registering signals displayed, the time of arrival and departure of trains and such other information as may be prescribed.

LESSON VIII

NUMBERING OF TRAINS

Regular trains are designated by numbers, this for the convenience of the train dispatcher and railroad employes. Train numbers are usually imaginary. By regular trains are meant trains that ar on the time table. All even numbered trains ar east or north bound, all odd numbered trains ar south or west bound, excepting extras.

Extra trains are designated by the engine number and the direction. Example: Engine 2936 is pulling an extra going west, this train would be known as Extra 2936 West.

Special trains are designated by the engine number and the word special. If engine 2842 were pulling a special train, the train would be known as Special 2842.

Work extras are designated by the words "Work Extra" and the engine number, thus if Engine 1926 were attached to a work train, the train would be known as Work Extra 1926.

SUPERIORITY OF TRAINS

A train may be superior to another train in three ways: By right, class, or direction. Right comes first and is conferred by train order. Class comes second and is conveyed by time-table. Example: First class trains have right over second class trains, and second class trains over third class trains, etc. Direction comes third. Example: East bound trains have right of track over west bound trains of the same class and north bound trains over south bound trains of the same class. A foot note on the time table of road you work for will indicate Superior direction.

TRAIN SIGNALS

Two green flags by day and in addition two green lights by night, displayed in the places provided for that purpose on front of the engine, denote that the train is followed by another train running on the same schedule and entitled to the same time table rights as the train carrying the signals.

MARKERS

The train while running, must display two green flags by day and two green lights by night, one on each side of the rear of the train, as markers to indicate the rear of the train. Yard engines will not display markers. Markers show green to the front and sides, and red to the rear. Red lights in this position are termed tail lights.

When a train or engine is running backwards, the markers will be found on the pilot of the engine.

WHITE SIGNALS

Two white flags by day and in addition, two

white lights by night, displayed in the places provided for that purpose on the front of the engine, denote that the train is an extra. These signals must be displayed by all extra trains but not by yard engines.

STATION SIGNALS

All employes whose duties require them to give signals must provide themselves with the proper appliances, and keep them in good order and always ready for immediate use.

Flags of the proper color must be used by day, and lamps of the proper color by night, or whenever from fog or other conditions, the day signals cannot be seen.

Red signifies danger, and is a signal to stop.

Yellow signifies caution, and is a signal to go slowly.

Green signifies safety, and is a signal to go on.

Green and White is used to stop trains at flag stations for passengers or freight.

Blue is a signal placed on a car to signify that there are workmen, under or about the car, and to forbid its being moved.

SIGNALS IN VERSE

The Blue light marks the crippled car,
The Yellow light signals slow,
The Red light is the danger light,
The Green light, let her go.

TORPEDOES

Torpedoes placed on top of a rail is a signal to be used in emergency, in place of the regular signals. The explosion of two torpedoes is a signal to reduce

speed immediately and look out for a train ahead or obstruction. The explosion of one torpedo will indicate the same as two but the use of two is required.

A flag swung across the track, a hat or any object waved violently by any person on the track signifies danger and is a signal to stop.

HAND, FLAG AND LAMP SIGNALS

MANNER OF USING	INDICATION
Swung across the track . . .	Stop
Raised and lowered vertically .	Proceed
Held horizontally at arms length when train is moving . . .	Reduce Speed
Swung vertically in a circle at half arms length across the track when train is standing	Back
Swung vertically in a circle at arms length across the track when the train is running .	Train has parted
Swung horizontally above the head when the train is standing	Apply air brakes
Held at arms length above the head when the train is standing	Release air brakes

ENGINE AND MOTOR WHISTLE SIGNALS

Note—The signals prescribed are illustrated by "o" for short sounds; "—" for longer sounds.

SOUND	INDICATION
o	Apply brakes. Stop.
— —	Release brakes. Proceed.
— ooo	Flagman protect rear of train.
— — — —	Flagman may return from west or south as prescribed by the Rules.
— — — — —	Flagman may return from the east or north as prescribed by the Rules.
— — —	When running, train parted; to be repeated until answered by prescribed signal.
oo	Answer to any signal not otherwise provided for.
ooo	When train is standing, back.
oooo	Calling for signals.
— oo	To call the attention of yard engines, extra trains or trains of the same or inferior class or inferior right to signals displayed for a following section. If not answered by a train the train displaying signals must stop and ascertain the cause.
— — oo	Approaching public crossings at grade.
———	Approaching stations, Junctions or railroad crossings.
— — o	Approaching meeting points.
o —	Inspect train line for leak.
Succession of short sounds	Alarm for persons or live stock on track.

COMMUNICATING SIGNALS

SOUND	INDICATION
oo	When standing, start.
oo	When running, stop at once.
ooo	When standing, back the train.
ooo	When running, stop at next passenger station.
oooo	When standing, apply or release air brakes.
oooo	When running, reduce speed.
ooooo	When standing, recall flagman.
ooooo	When running, increase speed.
oooooo	When running, increase train heat.
———	When running, look back for hand signals.

LESSON IX

OFFICE CALLS

Each telegraph station has an office call of one or two letters, which is used to notify the operator on duty at a station that he is wanted on the wire. Example: The office call for Chillicothe is HI, and the dispatcher's office call is DS, should the train dispatcher want the operator at Chillicothe on the wire, he would call, HI HI HI on his key and after the third call, he would sign his own office call DS. The dispatcher would keep on calling in this manner until the operator at Chillicothe answered, which he would do by opening his key and say I HI. The dispatcher would then tell him what was wanted.

The office call is used a great many times, instead of the station name, as in addressing Railroad Messages to stations on the same division, sub-division, or in OSing trains, etc.

PERSONAL SIGNS

Each operator has a personal sign of one or two letters, which he uses on the wire instead of his full name. Referring to example of above office call; suppose the operator at Chillicothe is John Brown and his personal sign is BR, should the dispatcher after getting Chillicothe on the wire ask, Who? or Wo? the operator at Chillicothe instead of saying John Brown, would merely say BR. As the dispatcher knows each operator's personal sign on his division, he would know at once that BR was John Brown.

"OS" ING TRAINS

Probably the first thing the beginning Railroad Telegraph student will have to learn to do is to "OS" a train. A Record Sheet is kept at each station, showing the time that each train arrives and departs, or is by said station. The letters or symbol "OS" means Order Sheet or Train Sheet on which this record is kept.

We will suppose that No 12 has just arrived at Chillicothe and stopped and has departed. As soon as No 12 has departed and as soon as the wire is not busy, the operator at Chillicothe would open his key and say: OS HI No 12 ar 240 d 242 HI. OS means Order Sheet, HI the office call for Chillicothe, No 12 the number of the train, ar for arrived, 240 the time the train arrived at station, d for departed, 242 the time the train departed and HI the office call for Chillicothe. The train dispatcher would take this information on his train sheet as it was being transmitted and acknowledge same by opening his key and saying I. Should No. 12 go by the station at Chillicothe without stopping, the operator would OS in this manner: OS HI No 12 by 240 HI, meaning that No 12 had gone by the station at 240, without stopping.

THE TRAIN ORDER MANIFOLD

The train order Manifold is simply a pad of train orders with carbon sheets arranged so that the requisite number of copies can be made at one writing. A copy of each train order must be made for each person addressed and one to be kept on file by the operator. There are two forms of train orders in use on most roads, the 19 and 31 forms. At each telegraph station usually about four pads of 19 orders are kept made up ready for making 3 copy, 5 copy, 7 copy and 9 copy, and the same is true with the 31 order Manifolds.

When the dispatcher calls an office and says 31 cy 3, the operator immediately gets his 3 copy 31 Manifold and is ready to copy, or if he says 19 cy 5 he gets his 5 copy 19 Manifold, etc. The train order Manifold must be kept made up in readiness at all times, so that the dispatcher will not have to be delayed by waiting for the operator to get the Manifold ready.

RULES FOR MOVEMENT OF TRAINS BY TRAIN ORDERS

For movements not provided for by time-table, train orders will be issued by authority and over the signature of the Superintendent, Train Master or the Chief Train Dispatcher. They must contain neither information nor instructions not essential to such movements.

They must be brief and clear; in the prescribed forms when applicable; and without erasure, alteration or interlineation.

Figures in train orders must not be surrounded by brackets, circles or other characters.

Each train order must be given in the same words to all employes or trains addressed.

Train orders must be numbered consecutively each day, beginning at midnight.

Train orders must be addressed to those who are to execute them, naming the place at which each is to receive his copy. Those for a train must be addressed to the conductor and engineman, and also to anyone who acts as its pilot. A copy for each employe addressed must be supplied by the operator. Orders addressed to operators restricting the movement of trains must be respected by conductors and enginemen the same as if addressed to them.

Each train order must be written in full in a book provided for the purpose at the office of the Train Dispatcher; and with it recorded the names of those who have signed for the order; the time and the signals which show when and from what offices the order was repeated and the responses transmitted; and the train dispatcher's initials. These records must be made at once, and never from memory or memoranda.

In train orders regular trains will be designated as "No 10" and sections as "Second 10," adding engine number if desired. Extra trains will be designated by Engine Numbers and the direction as "Extra 798 East or West."

In transmitting train orders by telegraph time may be stated in figures only or duplicated in words. Even hours must not be used in stating time of day in train orders, such as 10:00 a. m.

To transmit a train order, the signal "31" or the signal "19" must be given to the office addressed, the number of copies being stated thus: "31 copy 5," or "19 copy 3."

A train order to be sent to two or more offices must be transmitted simultaneously to as many of them as practicable. When not sent simultaneously to all, the order must be sent first to the superior train.

The several addresses must be in the order of superiority of trains, each office taking its proper address, and when practicable must include the operator at the meeting or waiting point.

Copies of the order addressed to the operator at the meeting or waiting point must be delivered to the trains affected until all have arrived from one direction.

A train order must not be sent to a superior train at the meeting point if it can be avoided. When an order is so sent, the fact will be stated in the order and special precautions must be taken to insure safety.

Operators receiving train orders must write them in manifold during transmission. If they cannot at one writing make the requisite number of copies, they must make others from one of the copies previously made, and repeat to the train dispatcher from the new copies each time additional copies are made. They must retain a copy of each train order.

LESSON X

RULES FOR MOVEMENT OF TRAINS BY TRAIN ORDERS—Concluded

When a "31" train order has been transmitted, operators must, unless otherwise directed, repeat it at once from the manifold copy in the succession in which the several offices have been addressed and then write the time of repetition on the order. Each operator receiving the order should observe whether the others repeat correctly.

Those to whom the order is addressed, except enginemen, must then sign it, and the operator will send their signatures preceded by the number of the order to the Dispatcher. The response "complete" and the time, with the initials of the————————, will

then be given by the train dispatcher. Each operator receiving this response will then write on each copy the word "complete," the time, and his last name in full, and then deliver a copy to each person addressed, except enginemen. The copy for each engineman must be delivered to him personally by ————.

Enginemen must show train orders to firemen and when practicable to forward trainmen. Conductors must show train orders when practicable to trainmen.

When a train order has been repeated or "X" response sent, and before "complete" has been given, the order must be treated as a holding order for the train addressed, but must not be otherwise acted on until "complete" has been given.

If the line fail before an office has repeated an order or has sent the "X" response, the order at that office is of no effect and must be there treated as if it had not been sent.

For train orders delivered by the train dispatcher the requirements as to the record and delivery are the same as at other offices.

A train order to be delivered to a train at a point not a train order office, or at one at which the office is closed, must be addressed to—

"C and E————at————, care of ————," and forwarded and delivered by the conductor or other person in whose care it is addressed. When form 31 is used "complete" will be given upon the signature of the person by whom the order is to be delivered, who must be supplied with copies for the conductor and enginemen addressed, and a copy upon which he shall take their signatures. This copy he must deliver to the first operator accessible, who must reserve it, and at once transmit the signatures of the conductor and enginemen to the train dispatcher.

Orders so delivered must be acted on as if "complete" had been given in the usual way.

For orders which are sent, in the manner herein provided, to a train, the superiority of which is thereby restricted, "complete" must not be given to an inferior train until the signatures of the conductor and engineman of the superior train have been sent to the Dispatcher.

When a train is named in a train order by its schedule number alone, all sections of that schedule are included, and each must have copies delivered to it.

An operator must not repeat or give the "X" response to a train order for a train which has been cleared or of which the engine has passed his train order signal until he has obtained the signatures of the conductor and engineman to the order.

Train orders once in effect continue so until fulfilled, superseded or annulled. Any part of an order specifying a particular movement may be either superseded or annulled.

Orders held by or issued for or any part of an order relating to a regular train become void when such train loses both right and schedule as prescribed by Rules 4 and 82, or is annulled.

When a conductor or engineman, or both, is relieved before the completion of a trip, all train orders and instructions held must be delivered to the relieving conductor or engineman. Such orders or instructions must be compared by the conductor and engineman before proceeding.

When a "19" train order has been transmitted, operators must, unless otherwise directed, repeat it at once from the manifold copy, in the succession in which the several offices have been addressed. Each operator receiving the order should observe whether the others repeat correctly. When the order has

been repeated correctly by an operator, the response "complete" and the time, with the initials of the ————————, will be given by the train dispatcher. The operator receiving this response will then write on each copy the word "complete," the time, and his last name in full, and personally deliver a copy to each person addressed without taking his signature. But when delivery to engineman will take the operator from the immediate vicinity of his office, the engineman's copy will be delivered by————————.

When a "19" train order restricting the superiority of a train is issued for it at the point where such superiority is restricted, the train must be brought to a stop before delivery of the order.

When so directed by the train dispatcher, a train order may be acknowledged before repeating, by the operator responding:

Number of Train Order Train Number
"X,———————— to ————————," with the operator's initials and office signal. The operator must then write on the order his initials and the time.

"Complete" must not be given to a train order for delivery to an inferior train until the order has been repeated or the "X" response sent by the operator who receives the order for the superior train.

A fixed signal must be used at each train-order office, which shall indicate "stop" when there is an operator on duty, except when changed to "proceed" to allow a train to pass after getting train orders, or for which there are no orders. A train must not pass the signal while "stop" is indicated. The signal must be returned to "stop" as soon as the train has passed. It must be fastened at "proceed" only when no operator is on duty.

Operators must have the proper appliances for hand signaling ready for immediate use if the fixed

signal should fail to work properly. If a signal is not displayed at a night office, trains which have not been notified must stop and ascertain the cause, and report the facts to the————————from the next available point of communication.

Where the semaphore is used, the arm indicates "stop" when horizontal and "proceed" when in a vertical or diagonal* position.

A fixed signal must be used at each train order office, which shall indicate "stop" when trains are to be stopped for train orders. When there are no orders the signal must indicate "proceed."

When an operator receives the signal "31" or "19" followed by the direction, he must immediately display the "stop signal" for the direction indicated and then reply "stop displayed," adding the direction; and until the orders have been delivered or annulled the signal must not be restored to "proceed." When "stop" is indicated trains must not proceed without a clearance card.

Operators must promptly record and report to the Dispatcher the time of departure of all trains and the direction of extra trains. They must record the time of arrival of trains and report it when so directed.

The following signals and abbreviations may be used:

Initials for signature of the Supt. or Train Master. Such office and other signals as are arranged by the Superintendent.
C&E—For Conductor and Engineman.
C&M—For Conductor and Motorman.
X—Train will be held until train order is made "complete."
Com—For Complete.
OS—Train Report.

No—For Number.
Eng—For Engine.
Sec—For Section.
Psgr—For Passenger.
Frt—For Freight.
Mins—For Minutes.
Jct—For Junction.
Dispr—For Train Dispatcher.
Opr—For Operator.
31 or 19—To clear the line for Train Orders, and for Operators to ask for Train Orders.
SD—For "Stop Displayed."
The usual abbreviations for the names of the months and stations.

LESSON XI

EXPLAINING THE "19" ORDER

Should the Train Dispatcher wish to send a "19" train order to Brunswick alone, he would first call Brunswick on the wire, BR BR BR and sign DS. When the operator at BR answered by saying "I BR," the dispatcher would say, "19 Copy 3" and the operator at BR would immediately get down his 3 copy 19 manifold and get ready to copy. The dispatcher would then proceed in this manner:

Order No 1 to C & E No 13 "BR." (PERIOD)
No 13 Eng 2936 will meet No 12 Eng 2822 at Sumner. (PERIOD)
Sig E M R.

As soon as the Dispatcher has finished sending the order the operator at Brunswick will repeat in this manner:

BR 19 3 Order No 1 C & E No 13 BR. No 13 Eng 2936 will meet No 12 Eng 2822 at Sumner. Sig

E M R. (The operator sometimes adds his own personal sign).

When the operator has repeated correctly, the Dispatcher will say "Complete" and give the time, which the Operator will write in the space provided at the bottom of the order. The operator will also sign his last name in the place provided. The order is now ready for delivery.

If No 13 is scheduled to stop at Brunswick, the operator will tear off the first two copies and deliver them to the Conductor when he comes into the station, the conductor giving one copy to the engineman, the operator filing the third copy.

If No 13 is not scheduled to stop at Brunswick, the operator will place a copy of the train order in a hoop provided for the purpose and hand it up to the engineman as the engine passes and then hand up the second copy to the conductor as he passes the station, keeping the train order board at stop, so that if either the conductor or engineman fails to get his copy of the order, the train must be brought to a stop. A copy of the Clearance card must also be given with orders handed up in this manner.

EXPLAINING THE "31" ORDER

Should the dispatcher wish to send a "31" Order to Pattonsburg alone, he would first call Pattonsburg on the wire, PG PG PG and sign DS. When the operator at Pattonsburg answered by saying I PG, the dispatcher would say "31 Copy 3." The operator at Pattonsburg would immediately get down his 3 copy 31 manifold and get ready to copy. The dispatcher would proceed in this manner: Order No 2 to C & E No 14 PG. (PERIOD) No 14 Eng 2621 will meet No 15 Eng 3122 at Chillicothe. (PERIOD) Sig E M R. As soon as the

THE NORTH MISSOURI RAILWAY COMPANY

TRAIN ORDER No. *1*

FROM *Moberly Mo Jan 31* 19 *23*

19	TO *C & E No 13*	AT *Brunswick*

No. 13 Eng 2936 will meet No 12 Eng 2822 at Sumner

E. M. R. T. M.

CONDUCTOR AND ENGINEMAN MUST EACH HAVE A COPY OF ORDER

Made *Complete* Time *5:40 P* M *Miller* Opr.

THE NORTH MISSOURI RAILWAY COMPANY

TRAIN ORDER No. *2*

FROM *Moberly Mo Jan 31* 19*23*

31	To *C & E No 14*	At *Pattonsburg* Station
	X _____ Opr.	_____ M

No 14 Eng 2621 will meet No 15 Eng 3122 at Chillicothe

E. M. R. T. M.

CONDUCTOR AND ENGINEMAN MUST BOTH HAVE A COPY OF ORDER

REPEATED AT *2:16 P* M.

CONDUCTOR	TRAIN	MADE	TIME	OPERATOR
Jones	*No 14*	*Comp*	*2:30 p m*	*Cole*

Dispatcher has finished sending the order, the operator at Pattonsburg will repeat in this manner: PG 31 3 Order No 2 C & E No 14 PG. (PERIOD) No 14 Eng 2621 will meet No 15 Eng 3122 at Chillicothe. (PERIOD) Sig E M R. The Dispatcher will then say "OK." The operator will then note the time and write it in the space on the order where it says "Repeated At."

The 31 still in manifold lies on the operators desk until No 14 arrives. Mr. Jones, which we will assume is the conductor's name on No 14, will come into the station, read the order over carefully and sign his name "Jones" in the space provided for the Conductor's name on the bottom of the order, also the "NO" of his train in the space provided for that purpose. The operator will then open his key on the dispatcher's wire and say, "31 Order No 2 Sig Jones No 14 PG." The dispatcher will then say "Complete" and give the time, which the operator will write in the spaces provided and also sign his last name as operator. The operator will then tear off the first two copies and give to the conductor and place the third copy on file. He will then arrange his train order manifold in readiness to take another order.

THE DOUBLE ORDER SYSTEM

On the preceeding pages the 19 Order and the 31 Order have been explained separately, so that the student should understand each order, how to get a complete on each order, etc., thoroughly. The student will notice that the chief difference between the 19 and 31 Order is that the 31 has to be signed by the conductor before being made complete while the 19 does not.

We will now take up the double order system,

which is the system of handling train orders used on practically all railroads. Rule 208 of the Standard Code of Train Rules, reads in part; "Train Orders to be sent to two or more offices must be transmitted simultaneously to as many of them as practicable," therefore when the train dispatcher has an order to put out which effects two or more trains, he will send the order to as many offices effected as possible simultaneously. The following chart will represent a subdivision of a railroad. The letter A will represent the station farthest west on the subdivision, and the letter M the station farthest east.

A B C D E F G H I J K L M

We will assume that Extra 219 East is just out of station C and Extra 224 West is just out of station K, these trains being headed toward each other on a single track road. The train Dispatcher begins to figure on a meeting point for these two trains, and concludes that the station G will be the meeting point. As soon as he has decided on G being the meeting point, he will call the station D on the wire. When D answers the dispatcher will say: 31 Copy 3, (The operator at D immediately gets down his 3 Copy 31 manifold and gets ready to copy). The dispatcher next calls the station J on the wire, when J answers the dispatcher will say: 19 Copy 3, (The operator at J immediately gets down his 3 copy 19 manifold and gets ready to copy). The dispatcher will then probably call G the meeting point and when G answers on the wire the dispatcher will say: 19 Copy 1, (G will get ready to copy).

The Dispatcher now has all offices affected on the wire and they are all ready to copy, he will now say: Order No 3, (each operator puts down No 3 in the space provided on the order for the Order No). The dispatcher will then say: To D, C & E

Extra 219 East, (the operator at D *only* puts this down on his 31 Order); the dispatcher will then say: To J, C & E Extra 224 West, (the operator at J *only*, will put this down on his 19 Order); the dispatcher will now say: To G, Operator, (the operator at G *only*, will put this down on his order).

Each operator now has the same order number but a different address and the dispatcher now makes a period which is the symbol in this instance for all to copy. The dispatcher will now continue with the text of the order and all operators will copy: Extra 219 East will meet Extra 224 West at G. (Sig) E M R.

As soon as the dispatcher has finished sending the order, the operator D will repeat the order back to the dispatcher. (The student will note that D was the first office addressed and also holds the order for the superior train, so it is D who must repeat back first). As soon as D has repeated back correctly, the dispatcher will give his "OK" and D will write the time repeated in the space provided on the 31.

Next J will repeat his 19, to which if correct, the dispatcher will give "Complete' and the time, which J will place, together with his last name, in the spaces provided for the same on the bottom of his 19 Order. Next G will repeat his one copy 19, to which the dispatcher will give the response "Complete" and the time which G will place together with his last name in the spaces provided on the bottom of his 19.

The two 19's are now complete and the 31 has been OK-ed, when Extra 219 East arrives at D and whistles for the clear board, the operator at D will hold the board against him. Extra 219 East will be compelled to stop. Conductor Smith comes into the station, reads over his 31 Order and will

sign his last name Smith in the space provided for the Conductor's name, also placing Exa 219 East in the space provided for the number of the train. The operator at D will then open his key and say to the dispatcher: 31 Order No 3 Sig Smith Extra 219 East D; the dispatcher will respond with "Complete" and the time which the operator will write, together with his last name, in the spaces provided on the bottom of his order. The operator will now tear the first two copies from his manifold and give same to the conductor and will place the third copy on file. The conductor will give one copy to the engineman. Some roads require that a copy be made for the Rear Brakeman.

A train must be stopped for the delivery of a 31 Order, but does not have to be stopped for the delivery of a 19. We will assume that Extra 224 West does not intend to stop at J, when the extra gets within sight of the train order board at J, the engineman will give four short blasts of the whistle, which is the signal the engineman will use to call for train orders, or if there are no train orders, to call for a clear board.

The Operator at J will leave his train order board at stop, and placing his 19 Order, together with a clearance card, in a hoop provided for handing up train orders when the train does not stop, gets out where the engineman can see him and with his hand or a lantern, give the engineman the proceed signal. When the engineman passes he will hand up a copy of the train order and clearance card, and will also hand up a copy to the conductor when the caboose passes.

This is only one of the many methods used for delivering a 19 train order without stopping a train. The train must always be stopped for the delivery

of a 31 train order. A great many roads are using the 31 as little as possible in order to save the delay involved in the delivery of the 31.

TO "X" AN ORDER

The letter X in telegraph work, means to acknowledge. Here is one example of "X'ing" an order. In the foregoing explanation of the double order system, we will assume that the dispatcher has just finished sending the 31 order to Extra 219 East at D, and the 19 order to Extra 224 West at J, etc.

The ruling is that the office addressed first which is the office holding the order for the superior train, must repeat first. In this case D has the 31 order for Extra 219 East which is the superior train. We will assume that Extra 219 East has just left C and the operator at D has plenty of time to get his order ready for delivery, while Extra 224 West is getting pretty close to J and the dispatcher does not wish to stop Extra 224 West, the dispatcher will tell the operator at D to "X" his order, which he will do by sending: 31 Order No 3 to C & E Extra 219 East X, his initials and then writing the time and his initials in the space provided under "X" on his order. J can then go ahead and repeat first, get his complete and deliver his order, thus saving the delay of waiting for D to repeat his order in full. After an order is "X'd," it is a holding order, Extra 219 East could not pass D until the balance of the order had been repeated and complete had been given.

LESSON XII

BREAKING IN TRAIN ORDERS

The student or beginning Telegrapher should bear in mind that when he is called on the wire and told to copy an order, he is expected to get that order absolutely correct without erasures, alterations or interlineations.

I have found that one of the hardest things a teacher of Telegraphy has to do is to teach the student of Telegraphy to break when he loses out on what he is copying. The Student should bear in mind that all good operators break rather than make a mistake. It is the poor, unqualified Telegrapher, who does not break, and who would rather make an error than to break.

By breaking is meant that if a student or operator does not get what is being sent, he should interrupt the sender by opening his key and sending the last word he has received correctly. In train orders should the operator lose out on the order number, he should open his key and say "No," should he lose out on the address he should open his key and say "To," should he lose out in the beginning of the body he should open his key and make (.), should he lose out in the body of the order he should repeat the last word or figure that he has, and if he should lose out on the signature, he should say "Sig," etc.

It is far better to break a dozen times in a train order and have it absolutely correct, than to go ahead without breaking and have your dispatcher call you down for making mistakes.

A FEW PRACTICAL TRAIN ORDERS

Order No 1 (to) C & E No 1.

No 1 Eng 234 meet No 2 Eng 456 at Bucklin.

(sig) *E M R*

Order No 2 (to) C & E No 13.

No 13 Eng 786 will pass No 15 Eng 657 at Cairo.

(sig) *J C N*

Order No 3 (to) C & E No 3.

Extra 95 West run ahead of No 3 Eng 879 until overtaken.

(sig) *W A C*

Order No 4 (to) C & E Extra 37 East.

Extra 37 East has right over No 3 Eng 895 Chillicothe to Brookfield.

(sig) *E L*

Order No 5 (to) C & E No 12.

No 3 Eng 465 run 50 minutes late Bevier to Bucklin.

(sig) *J W H*

Order No 6 (to) C & E No 72.

No 72 Eng 2935 wait at Laclede until 840 p m for No 83 Eng 7564.

(sig) *R B J*

Order No 7 (to) C & E Eng 711.

Eng 711 will display signals and run as First 72 Bevier to Brookfield.

(sig) *W C W*

Order No 8 (to) C & E Eng 658.

Eng 658 will run Extra Duran to Carrizozo.

(sig) *H S F*

Order No 9 (to) C & E Eng 292.

Eng 292 will work extra 645 a m until 545 p m between Callao and Kern.

(sig) *R W H*

Order No 10 (to) Operator.

Hold No 2.

(sig) *J D R*

Order No 11 (to) C & E All Concerned.

No 92 due to leave El Paso Saturday Feb 3rd is annulled El Paso to Carrizozo.

(sig) *C D B*

Order No 12 (to) Operator.

Order No 8 is annulled.

(sig) *V B N*

Order No 13 (to) C & E No 81.

That part of Order No 74 reading No 81 wait at Beverly until 545 p m is annulled.

(sig) *W H E*

Order No 14 (to) C & E No 1.

No 1 Eng 234 will meet No 2 Eng 456 at Callao instead of Bucklin.

(sig) *E M R*

Order No 15 (to) C & E All Trains.

Reduce speed to fifteen miles per hour over bridge 82.49.

(sig) *E M B*

Order No 16 (to) C & E All Trains.

C B & Q Box No 765849 on passing track at Wheeling has draw bar out of east end and has no brake is blocked and cannot be moved.

(sig) *W A V*

Practice the foregoing train orders on the wire so that you may BECOME familiar with the various forms.

THE CLEARANCE CARD

Whenever train orders are delivered to a train they are usually accompanied by a Clearance Card On this Clearance Card is stated the Number of train addressed, the date, time issued and Numbers of orders of each form which it accompanies and the operator's signature. Where Block System is used, it also states whether or not Block is clear.

Should the train order board be held against a train causing it to stop when there are no orders for the train, a clearance card must be issued before the train can proceed.

Below is a form of Clearance Card in common use.

THE NORTH MISSOURI RAILROAD COMPANY

CLEARANCE CARD

Darlington Sat *Jan 31* 19*23*

Conductor and Engineman No. *Extra 219 East*

I have no orders for your train except { Form 19 *None* / Form 31 *No 3*

Time *216 PM* *Roberts* Operator

LESSON XIII

BLOCK SYSTEM

On nearly all roads a system of moving trains is used called the Block System.

By Block System is meant that the road is divided into certain lengths of track of defined limits which are called blocks.

Only one train is allowed in a Block at one time except when given permission by the train dispatcher with a caution card or permissive card.

There are three standard Block Systems.

(1) Manual Block System, which is a system in which the signals are operated manually.

(2) Controlled Manual Block System, under which the signals are operated manually and are so constructed as to require the cooperation of the signalman at both ends of the Block to display a clear or a caution signal.

(3) Automatic Block System, under which the signals are operated by electricity or other agency actuated by a train or certain conditions affecting the use of a block.

DEFINITIONS

Block—A length of track of defined limits, the use of which by trains is governed by block signals.

Block Station—A place from which block signals are operated.

Fixed Signal—A signal of fixed location, indicating a condition affecting the movement of a train.

Block Signal—A fixed signal governing the use of a block.

Home Block Signal—A fixed signal at the entrance of a block to govern trains in entering and using that block.

Distant Block Signal—A fixed signal used in connection with a Home Block Signal to govern the approach thereto.

Block System—A series of consecutive blocks.

Manual Block System—A series of consecutive blocks, governed by block signals operated manually upon information by telegraph, telephone or other means of communication.

Automatic Block System—A series of consecutive blocks governed by block signals operated by electric, pneumatic or other agency actuated by a train, or by certain conditions affecting the use of a block.

Positive Block—Where only one train is allowed in a block.

Permissive Block—Where more than one train is allowed in a block.

Time Spacing—A method of spacing trains an interval of time.

Intermediate Siding—(1) A siding between block stations: (2) A siding where block office is closed.

The usual method of operation is to require an absolute block on all Passenger trains and a permissive block for Freight trains.

THE CAUTION CARD

Caution Cards are used in connection with Block signal work. A moving train holding a caution card must proceed with the train under control. Below is given a Caution Card properly filled out. Study this card carefully, it is self-explanatory. Caution cards are given a number by the Train Dispatcher, the same as are train orders. When a Caution Card is filled out by the operator, he must call the train dispatcher and get a number for it.

THE NORTH MISSOURI RAILROAD COMPANY

No. *219* **CAUTION CARD**

BLOCK IS NOT CLEAR

Chillicothe *Jan 31* 19 *22* *216* *P* M

Conductor and Engineman No. *12* will proceed cautiously from *Chillicothe*

To *Sumner*

Expecting to find *No 170 in Block*

E L Trainmaster

Signalmen will make three manifold copies and deliver in accordance with the rules.

(This form is printed on green paper)

THE PERMISSIVE CARD

Permissive cards are also used in connection with the manual block system. The permissive card is issued, allowing a train to move under certain conditions, usually on the arrival of another train. Below is a copy of a Permissive card properly filled out.

THE NORTH MISSOURI RAILROAD COMPANY

PERMISSIVE CARD No. *384*

BLOCK IS NOT CLEAR

Sumner Station *Jan 31* 19*23* *845* *A* M

Conductor and Engineman No. *72*

Block will be clear on arrival of No *91*

Engine *2836*

E L Trainmaster

Signalmen will make three manifold copies and deliver in accordance with the rules.

Trains receiving this card must not proceed until the train mentioned as being in the block has arrived.

(This form is printed on pink paper)

LESSON XIV

RAILWAY MESSAGES

A Railway Message is a message pertaining to the business of the Railroad Company, which is sent over the company's wires without charges.

Railway messages should be brief, concise and clear and only sent when absolutely necessary to the best interests of the company.

Form of Sending

First get the office on the wire to which the message is to be sent, or in the event the message is to some office where there is no direct wire from the sending office, call the Relay Office and then proceed in the following manner: Office call of sending office—Sending Operator's personal sign—Place from—Date—Address—Body of message and Signature of message.

Assume that the following message had just been handed you, the operator at Chillicothe to be sent.

Chillicothe, Mo. Feb. 6, 1925

R A Brannan,
Moberly, Mo.

Chillicothe tonight Darlington and Stanberry tomorrow.

A C Standley.

My Fm 1015a Rd

First you would call Moberly on the wire, whose office call is MY and when MY answered you would say: HR MSG, meaning that you had a message for him and that he should get his message blank and get ready to copy a message. Then proceed in the following manner: HI (which is your office call), BN (which we will say is your personal sign), fm (meaning from), Chillicothe Mo 6 (the numeral 6 meaning date), to, R A Brannan, MY (MY is used instead of spelling out Moberly in full when an office is on the same division), (period is made after MY to signify the beginning of the body of the message), Chillicothe tonight Darlington and Stanberry tomorrow, (period at close of body).

(sig) A C Standley.

The receiving operator will then signify that he has received the message correct by saying OK and giving his personal sign, which we will assume is RD. The sending operator will then write in the lower left hand corner of his sent copy the following: MY BN 1015a RD. MY is the office call of receiving office, BN the sending operator's personal sign, 1015a the time which the message was sent, and RD is the receiving operator's personal sign. The sending operator should be able to put all this except the receiving operator's sign on the face of the message with his left hand, so that when the receiving operator OK's, all he will have to put down will be the receiving operator's sign RD. Practice carefully this writing with your left hand while sending with your right, it will be difficult at first but you can soon master it. Just remember that you can do what others have done, if you try hard enough. Below is the form in which the receiving operator would copy this message on message clip.

HI BN RD

CHILLICOTHE MO 2/6/25

R A BRANNAN

MOBERLY

CHILLICOTHE TONIGHT DARLINGTON AND STANBERRY

TOMORROW

A C STANDLEY

1015A

Breaking in Railway Messages

When breaking in Railway messages, should you miss the office call, say (call), the personal sign, say (wo), the name of the place from which it is sent, say (fm), the date, say (date), in the address, say (to), in the beginning of the body, say (period), in the body of the message, (send the last word received), in the signature, say (sig).

Before you give "OK" to a message which you have copied, be sure that you have the message *Absolutely Correct*, if you are not absolutely sure about some word, or some part of the message, ask about it before you give your "OK." Remember that after you give "OK" and your personal sign, you are responsible, so be careful not to put your personal sign to anything that you are not sure of.

A Few Practical Railway Messages

The Railroad Messages have no check, the destination is usually known by the office call. For example in the first message MY is used for Moberly. Send a few of the following messages, using your own office call and personal sign.

Chillicothe, Mo. Feb 6 1923

Engr Exa 219 East
MY.
There is no water at Sumner get water at Brunswick.
E L

Chillicothe, Mo. Feb 6 1923

Condr No 91
MY.
Have two cars of stock for Kans City.
Agent.

Sumner, Mo. Feb 6 1923

J M S
OM.

Set out C R I & P 567582 HH gds for Omaha acct hot boxing.

J W J

Davis City, Ia. Feb 6 1923

M H Whitcomb
Car Repairer
Kingston Ia.

Have one 60 ton car loaded with wheat with draw bar out come at once.

W H Messinger.

Birmingham, Mo. Feb 6 1923

C H B
Sec 4man
N.

Help Newlin throw pit track tomorrow rush this work as we do not wish to delay Steam Shovel.

E M B

Brookfield, Mo Feb 6 1923

Agent
Wheeling.

This message when properly stamped and countersigned by you will be authority to pass H L Chapman Wheeling to Nettleton account operator.

R H Allen.

Springfield, Mo Feb 6 1923

All Agents.

Your attention is called to circular No 4499. Please see that all cars are loaded to capacity.

W H Barnes.

Billings, Mo. Feb 6 1923

Chief Special Agt
Springfield Mo.

Depot broken into last night ten dollars taken from cash drawer and one box shoes taken from freight room.

Agent.

Chicago, Ills. Feb 6 1923

All Agents.

Please search your baggage and freight room for large leather suitcase with initials J M S painted on side and advise this office by wire if found.

R Musick
G B A

Galesburg, Ills. Feb 6 1923

B J Coomes,
Steam Shovel Craneman
Callao Mo.

You will report to Steam Shovel Engr Joyce at Needles tomorrow morning. Pass on No 55.

J M D

LESSON XV

DUTIES OF OPERATORS

Operators will be appointed by the chief train dispatcher in his capacity as chief operator under authority of the superintendent of telegraph.

They will report to and receive their orders from the chief train dispatcher, and will comply with the instructions of the superintendent of telegraph; also of the head of the office in which they are employed, except when they conflict with other instructions.

They are required to be constantly on duty during the hours assigned, unless excused by the train

dispatcher. Except in emergency cases, they will not be allowed to remain on duty a longer time than that prescribed by law. Unless relieved by another, operators will be excused by the train dispatcher.

When relieving each other, they must make a transfer on a blank form provided for the purpose, of all orders that are not fully executed, and must see that the relieving operator fully understands them.

Under no circumstances should an operator accept a train order for a train of which he has the least doubt as to whether it has passed his station, unless instructed to do so by the train dispatcher, who has knowledge that the train has not passed.

In offices where more than one operator is on duty at the same time, but one operator will be permitted to handle train orders and clear trains.

In closing an office, cut out all instruments at the switchboard, exercising care not to cross the wires. The address of an operator must be kept posted in the bill box or elsewhere as directed, showing where he can be found.

Keep a register of the arrival and departure of all trains and report same to the train dispatcher; report the weather as required, and when any sudden change or heavy storm, make a special report.

Use great care in adjusting instruments at all times especially in bad weather; never open the key unless positive that wire is not being used. Contention for circuit will not be allowed.

At all offices where arrangement has been made for the handling of public telegraph business, operators will be held accountable for the prompt and proper handling and reporting of such business in conformity with the requirements of the telegraph company, and which they must understand, and will carry out the instructions of the superintendent of telegraph with regard to same.

See that the offices are kept in a neat and orderly condition; instruments clean and in good working order, and not take them apart or alter the arrangement of the wires, tables and appurtenances, without permission of the superintendent of telegraph, and notify him when repairs are needed.

If the line fails, each operator must at once test the wires and report, if possible, on which side of his office the failure is. In case of any trouble on them, they will quickly look for its whereabouts and be sure that it is not in their offices. The use of ground wires is strictly prohibited, except to test wires or in case of emergency.

They must invariably sign their office call when using the line for any purpose whatever. It is the duty of operators to promptly discover and remedy inside office troubles caused by open keys, loose connections, etc. They must know that the ground wires are in good condition, examine switchboards, keys, instruments and batteries each day, and know that all binding screws are tight, all connections good and properly made, and that paper or other inflammable matter is kept from the vicinity of wires and switchboards. They must familiarize themselves with switchboards and cutouts, so that they can properly switch wires in testing, see that wires are properly labeled on the switchboard and cooperate with the party testing wires, assisting in every way possible to clear wire trouble.

They must be courteous in their intercourse with persons transacting business at their offices, and over the wires. They will not receive messages to be transmitted free unless signed by an officer, agent or employe, or a reply to same.

Preserve messages sent and promptly deliver those received, consider all messages confidential, and not permit them to be read by any person except

those to whom they are addressed, nor make their contents the subject of conversation or remark.

All messages not relating to the business of the Company must be paid for, unless otherwise ordered by the proper authority.

Railroad messages, after being transmitted, must be filed daily, and preserved until otherwise ordered.

A separate file must be kept of copies of all train orders and forms used for train movement and preserved until otherwise ordered.

Messages received for delivery to a general officer enroute, must be enclosed in an envelope, sealed and addressed.

All instruments will be furnished by the company, and no private instrument will be allowed on the wires. No private lines must be connected with the offices or buildings without permission of the superintendent of telegraph.

Standard time will be sent from 9:57 a. m. until 10 a. m. daily, and has absolute right to the circuit.

The wires are not to be used for the transmission of communications which may be sent by train without detriment to the company's interests, and operators should report any such cases observed.

Breaking in upon the circuit while time is being sent is positively prohibited, and operators must be sure that their instruments are properly adjusted.

Telegraph students will not be permitted to receive or forward messages except in the presence of the regular operator, and under his direction. The attention of students must be directed to the rules of the company, and particularly those relating to the privacy of telegrams.

There must be no delay in obtaining answer to messages. If a reply cannot be had in reasonable time, the sending office must be promptly notified the reason.

LESSON XVI

BEGINNING COMMERCIAL TELEGRAPHY

Commercial Telegraph Companies are those used by the public for the transaction of business by Telegraph.

Commercial Messages are those filed by the public for transmission over the wires of a commercial telegraph company.

As in Railroad work Commercial Companies have a list of rules outlined in their tariff book which the student should study carefully. As these rules are subject to change, it would be useless to embody them all in this work. The writer has endeavored to set forth the Fundamental Principles of Commercial Telegraphy, and expects the student to make a careful study of the rules as set forth in the tariff book, before attempting to handle any of the larger Commercial Telegraph positions.

Services Furnished

The Telegram: A fast message, the charge for which is based on ten words, with an additional charge for each word in excess of ten words.

Night Message: Accepted up to Two O'clock a. m. at reduced rates, charges based on ten words, with an additional charge for each word in excess of ten, to be sent during the night and delivered not earlier than the morning of the next ensuing business day.

Day Letter: A deferred day service at rates lower than the standard telegram rates, as follows: One and one-half times the standard telegram rates for the transmission of fifty words or less, and one-fifth of the fifty word rate for each additional ten words or less.

Night Letter: Accepted up to Two O'Clock a.

m. for delivery on the morning of the ensuing business day, at rates still lower than the standard night message, rate as follows The standard telegram rate for ten words shall be charged for fifty words or less and one-fifth of such standard telegram rate for ten words shall be charged for each additional ten words or less.

In addition to these services, are the Press Service, Government Service, Commercial News Department, Weather Service, Cable Service, Wireless Service, and numerous others which are fully explained in the tariff book.

Method of Counting Chargeable Words

All words, figures and letters in the text of domestic messages are counted and charged for. Dictionary words taken from the following languages, viz.: English, German, French, Italian, Dutch, Portuguese, Spanish, Latin, initial letters, surnames of persons, names of countries, counties, cities, towns, villages, states or territories, or names of the Canadian Provinces are counted and charged for each as one word. Abbreviations of the names of countries, counties, cities, towns, villages, states, territories and provinces are counted and charged for as if written in full. All groups of letters, when such are not dictionary words of one of the eight languages above named, or the combinations of such dictionary words, are counted at the rate of five letters to a word. When such groups are made up of dictionary words of one of the above specified languages, each dictionary word so used will be counted as one word. Figures, decimal points and punctuation marks and bars of division, if transmitted, are counted, each separately, as one word. For example: A3C is three words. Any punctuation marks appearing in the text of the message, if to be transmitted, are

counted and charged for. Abbreviations of weights and measures in common use are counted as one word.

In ordinal numbers, the affixes st, d, nd, rd, and th, are each counted as one word.

All signatures where there are more than one, except the last, are counted and charged for. For example, in the signature, "John Brown and James Smith," John Brown and, are extra. Signatures like "John and Emma," however contain no extra words.

All words after the last or only signature are also counted and charged for. For example: John Brown, President, contains one extra word. Ltd., or Inc., however, being a part of the name, are not counted as extra words.

All extra words in the address are counted and charged for. For example in a message addressed, "John Smith or James Brown, 80 Wall Street, New York, the words (or James Brown) are extra.

Messages addressed, for example: "W Brown, 197 Broadway and B Wells, Exchange Place, New York," are counted for as two telegrams, and a copy delivered to each person addressed.

In Collect Messages, the word (collect) is counted in the check, but not charged for.

How to Find Rates

To ascertain the rate for a full rate telegram or night message refer first to the tariff book and the latest tariff circular of the company, and note the number, if any, of the square before the name of the office; then refer to the rate sheet showing the square and state rates. If there be a square rate to the number noted, which is lower than the state rate to the state, territory or province in

which the office is situated, then the square rate will be the rate desired, but if there be no square rate to that number, or if the square rate given, be higher than the state rate, then the state rate will be the rate to use.

Star Stations

The student will note when referring to the Western Union Tariff book, that some stations indexed have stars before them instead of numbers.

When a station has one star before it, this denotes that the station is located on telegraph lines owned and operated by a Telegraph Company other than the Western Union, The International Ocean, or the Great North Western Telegraph Companies. If you will turn to the first page under Alabama, you will note that Boyd Alabama is listed thus:

*Boyd. 25-2 York.

To find the rate on a message to Boyd, Ala., you would first look up the rate to York, Ala., then add to it twenty-five cents for ten words and two cents for each additional word.

Stations, places, establishments or institutions to which messages are delivered from nearest Telegraph office are designated by two stars. Turn again to your Western Union Tariff book on the first page under Alabama, and you will find Avondale, Ala., listed thus:

**Avondale. 15-0 Birmingham (Tel. Sub. Free).

To find the rate to Avondale, Ala., you would first determine the rate to Birmingham, Ala. If the addressee of the message is a Telephone subscriber, the rate to Avondale would be the same as the rate to Birmingham. If the Addressee is not a Telephone subscriber the rate to Avondale would be the rate to Birmingham plus 15 cents.

Places where the Western Union Telegraph Co. has no office, but to which Messages are transmitted by telephone from a nearby telegraph office, are designated by three stars, when there is no agent or representative of the telegraph company at the place reached by telephone, thus:

***Alexandria. Free, Sub. only, Anniston.

This means that the rate to Alexandria, Ala., would be the same as the rate to Anniston, Ala., to Telephone subscribers only.

By four stars, when there is an Agent of the telegraph company at the place reached by telephone, for the delivery of messages to and the acceptance of messages from non-telephone subscribers, thus:

****Allenville. 15-0 Demopolis.

Thus the rate to Allenville, Ala., would be the same as the rate to Demopolis, Ala., plus 15 cents.

TRANSMITTING AND RECEIVING MESSAGES

Route and Count to be Decided Before Transmission.

Before transmitting a message decide as to proper route and as to the correct word count.

Office Calls.

When calling a distant office, sign your own office call at short intervals. Also sign it in answering calls.

Speed of Transmission.

The sending operator will regulate the speed of transmission to suit the ability of the receiving operator.

Contention for Circuit—Wire Tests.

(a) Contention for circuit is positively prohibited.

(b) The word "wire" will be recognized as giving the right of circuit at all times for testing purposes.

Order of Transmission.

In transmitting messages observe the following order:

1. Message number, office call sending ofs.
2. Check.
3. Office call, if message originates at a branch office.
4. Place from.
5. On day messages, day letters, day press matters and CAK messages, the filing time.
6. Date.
7. Name to, address and destination.
8. Body or text.
9. Signature.

In sending a cable message, designate the class by preceding the transmission with the word "Cable."

On messages originating on the lines of another telegraph company and transferred to this company, no filing time will be shown except where the message as transferred to us shows the time when the message was filed at the point of origin, and in such cases the original filing time so shown will be transmitted.

When a message sent over the lines of this company is forwarded from the original point of destination to another point, the forwarding office will not show any filing time on the forwarded copy, but will date the message in accordance with Rule 8.*

Note * Western Union Tariff Book.

Transmission of Checks.

(a) Transmit all figures and words in the check of a message except:

1. The indication "paid" and the amount of tolls.

2. The reason why CAK or DH in the case of a CAK or DH message.

(b) When the check of a message shows prepayment of delivery charges, transmit the number of words, the abbreviation "Dly." and the amount paid for delivery. Example: Message checked.

"10 Paid 60 Delivery 25,"

transmit check:

"10 Dly. 25."

(c) Whenever the amount of tolls is shown in the check of a collect forwarded message, the figures representing the amount will be transmitted as a part of the check.

(d) Whenever the check of a collect message shows the amount of "this-line" and "other-line" tolls, for example:

"11 Collect 60 and 25,"

transmit the full check.

(e) When a message is checked in the manner shown in the following examples:

"10 CAK No..... and Paid 38," or
"10 DH No..... and Paid 20," or
"10 Paid 25 and CAK No.....," or
"10 Paid 50 and DH No. .....?" or
"CAK No..... and CAK No.....," or
"DH No..... and DH No....."

transmit the full check, except the frank number and the amount of the tolls, as follows:

"10 CAK and Paid,"
"10 DH and Paid,"
"10 Paid and CAK,"
"10 Paid and DH,"
"CAK and CAK,"
"DH and DH."

Number, Time and Person Signal.

(a) Write upon the face of each message sent the consecutive number to and the call of the distant

office, the signal of the sending operator, time sent and signal of receiving operator, in the order given. Example: 23CH MA 815A HA.

(b) Do not regard the message as sent until acknowledged by the distant operator, unless several messages have been sent in succession, when the acknowledgment of the last will be regarded as an acknowledgment of all.

(c) No operator will change his personal signal without the consent of the manager or chief operator, nor will any two operators in the same office use the same signal.

Messages Delayed in Transmission.

Note the cause of delay on the back of the message or number sheet, when for any reason a message cannot be transmitted promptly. Also report the facts to the manager or chief operator.

All Messages To Be Transmitted Before Closing.

Transmit all messages to their destination or to the nearest relay office before closing. If for an unavoidable reason any are held over until the following morning, transmit them before new business.

Order of Receiving.

(a) Copy each message as transmitted. Enter on the blank after the number of the message, the call of the sending office and the receiving operator's signal.

(b) Verify the check by counting the number of words. Make sure the message has been correctly received.

(c) Write the time received below the signature and acknowledge receipt by giving the sending office an "O. K." followed by personal signal.

Messages to More Than One Address.

When a message is addressed, for example, to "A or B" for delivery to either, transmit it as a single message. When a message is addressed to "A and B," or to several persons, for delivery to each of them, transmit the check, place from, date, text and signature at one sending and fill in the addresses afterward so as to use the wire facilities to the best advantage.

Duplicate Transmission.

(a) If a second transmission is necessary in order to correct an error in a message, or for any other reason, begin the second transmission with the word "Duplicate."

The receiving operator will write or stamp the word "Duplicate" conspicuously on the form above the message, also following the check.

(b) If the service message requesting a duplicate is signed by a branch office or by an individual employe, insert as a part of the address of the duplicate, before the destination, the word "care" followed by the name of the branch office or employe signed to the service message.

(c) Do not send a service message with a duplicate unless for some special reason.

Transmission of Repeated and Valued Messages.

(a) Observe special care in sending or receiving a message bearing in the check the indication, "Repeat Back," or "Valued $....," or "Repeat back valued $...."

(b) Repeat back such messages at each stage of transmission from point of origin to destination.

(c) Make careful comparison with the original as the message is repeated back, underlining or checking each word and, if found to be correct, write across the face of the message the words, "Repeated back O. K." followed by the signals of both operators.

Examination of Sent Messages for Evidence of Transmission—Comparison of Numbers.

(a) Before closing the office for the night, carefully examine all "sent" messages to see that they bear the proper indication of transmission.

(b) Also examine the numbers, on messages sent and received, to see that none is missing. Compare numbers with other offices with which message have been exchanged during the day, correcting any errors discovered.

(c) Offices at which the closing hour is later than 12 midnight and offices open at all hours shall compare and close number sheets (which have not already been compared and closed) with offices in the same time belt at 12 midnight.

(d) Number sheets on circuits or channels which are closed at or prior to 12 midnight shall be compared and closed at the time the circuit is closed.

(e) When a circuit terminates at offices in different time belts, number sheets (which have not already been compared and closed) shall be compared and closed at the time corresponding to 12 midnight at the office located in the time belt farthest west. The office located in the time belt farthest west shall initiate the closing.

Wire Tests, Cutting Out Instruments at Night, Etc.

(a) Make early morning tests of the wires. Call attention to any that may be out of order and keep a daily record of all such interruptions.

(b) Assist distant wire chiefs and linemen as much as possible in locating and clearing trouble.

(c) Use the ground wire at an intermediate office in the event of an interruption of the circuit, but then only long enough to notify the distant wire chief and receive his instructions.

(d) Before closing the office temporarily or for the night, cut out the instruments, being careful that the circuit through the switch or cut-off is complete.

(e) Keep batteries in good condition, and see that each cell is thoroughly insulated so as to prevent any escape of current. Also keep the floors, shelves and fixtures of the battery room scrupulously clean. For detailed instructions concerning care of batteries, see Rule 49 Western Union Tariff Book.

LESSON XVII.

Numbering Messages

All smaller offices send their messages to the relay office, which is an office centrally located for the purpose of forwarding messages to their correct destinations.

Messages are numbered consecutively, beginning at midnight each day. To assist in keeping the numbers straight, a number sheet is furnished, a copy of which is herewith shown.

When Chillicothe sends its first message to the relay office at Kansas City in the morning, he checks off the figure 1, on the sent side, and when he sends his second, he checks off 2, etc. When he receives one from Kansas City, he checks off 1, on received side, etc. He will compare numbers at intervals with the relay office, to see that each office is keeping his number sheet straight.

Numbers must be exchanged and verified nightly at closing hour. Endorse time and letter on sheet.

THE NORTH MISSOURI TELEGRAPH COMPANY

Number of Circuit..... Date.....192...

Receiving and Sending Operators will be held responsible for correct records of numbers. Check off immediately.

SENT	REC'D	SENT	REC'D	SENT	REC'D	SENT	REC'D
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
0	0	0	0	0	0	0	0

Endorse all Delays (and cause—far as known) on back of Each Message and Notify Chief Operator Immediately.

Accepting Message for Transmission

We will assume that a customer has just entered the Telegraph Office at Chillicothe, and has filed the following message to be transmitted.

CLASS OF SERVICE DESIRED	
Telegram	X
Day Letter	
Night Message	
Night Letter	

Patrons should mark an X opposite the class of service desired; OTHERWISE THE MESSAGE WILL BE TRANSMITTED AS A FULL-RATE TELEGRAM.

NORTH MISSOURI TELEGRAPH CO.

TELEGRAM

RECEIVER'S No.	
	A R C
CHECK	
	11 Paid
TIME FILED	
	805 A M

Send the following message subject to the terms on back hereof, which are hereby agreed to.

Chillicothe Mo Feb 9 19 *23*

To *James C Gregory*

Street and No. *4296 Armstrong Ave*

Place *Springfield Mo*

Send papers to me care Westgate hotel Kansas City

Leaving here tomorrow

B C Hammond

SENDER'S ADDRESS FOR ANSWER *Leeper Hotel* SENDER'S TELEPHONE NUMBER

The Manager will first count the check and place the number of chargeable words in space provided for check, also if paid or collect, in collect messages the word collect is counted but not charged for, for example: If a ten word message were to be sent collect, the check would be 11 collect.

The Manager will then place his initials in space provided for Receiver's No. In case the sender wishes to pay the charges the manager will then look up the rate and collect amount stated in tariff book. He will then note the time, and place it in the space provided for time filed. If the sender is not well known he should be asked to place his address in the space provided for sender's address at the bottom of the message, also his telephone number if he can be reached by telephone. The Manager should also see that the customer checks the class of service desired in the upper left hand corner of blank. The message is now ready to be transmitted.

Order of Transmission

In transmitting the foregoing message, the operator will first call Kansas City on the wire as Kansas City is the Relay Office which the message will pass through, to be sent to Springfield, Missouri. As soon as Kansas City answers the operator at Chillicothe will proceed in the following manner: "1" (being the number of the message), "HI" (which is the office call for Chillicothe), "11" (the check of the message), "Chillicothe Mo 805 am 9" (this being the place from, time filed and date), James C Gregory, (comma) 4296 Armstrong Ave Springfield Mo. (period), Send papers to me care Westgate Hotel Kansas City leaving here tomorrow (sg) B C Hammond. The sending operator will close his key and the receiving operator will open his key and after counting the check to see if it corresponds

with the check number given in the heading by Chillicothe, will say OK and give his personal sine which we will assume is "GJ."

The sending operator whose personal sine we will assume is "GY," will then place the following sending marks on the face of the sent message: 1 KS GY 810A GJ. "1" is the number of the message, "KS," the office call of office to which message was sent, "GY," the sending operator's personal sine, "810 a," the time sent, and "GJ," the receiving operator's sine. These signals are here shown as they should appear on the sent copy. All sent copies should be filed at close of day. The sending operator should practice writing with his left hand while sending with his right, until he gets so that he can make these notations on the sent copy while he is sending it with his right.

When the sending operator has several messages to transmit, the receiving operator will give "OK" and his personal sine for the first one, then the sending operator will continue to send until he is clear of all messages and when he finishes the receiving operator will give "OK" and his personal sine for the balance of the messages received.

Message to James C. Gregory, as copied by the relay office in Kansas City. Notice the exact form in which all commercial messages must be copied.

1HI GJ 11

CHILLICOTHE MO 805A FEB 9 1923

JAMES C GREGORY

4296 ARMSTRONG AVE SPRINGFIELD MO

SEND PAPERS TO ME CARE WESTGAGE HOTEL KANSASCITY LEAVING HERE TOMORROW

B C HAMMOND

810A

Form 1201

CLASS OF SERVICE
This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

NORTH MISSOURI TELEGRAPH CO.

TELEGRAM

SIGNS	
DL	= Day Letter
NM	= Night Message
NL	= Night Letter
LCO	= Deferred Cable
CLT	= Cable Letter
WLT	= Week-End Letter

Received at 305 College St. Springfield, Mo.

16KS RO 11

CHILLICOTHE MO 805A FEB 9 1923

JAMES C GREGORY

4296 ARMSTRONG AVE SPRINGFIELD MO

SEND PAPERS TO ME CARE WESTGATE HOTEL KANSASCITY

LEAVING HERE TOMORROW

B C HAMMOND

830A

Note. After the office call of the sending office is sent the receiving operator must put in his personal sine, and while the sending operator only makes the numeral "9" for the date the receiving operator must write out in full, Feb. 9, 1923. The receiving operator must also put down the time the message was received immediately after the signature.

Below is a copy of the same message as copied by the office at Springfield, Mo., as relayed there by Kansas City.

1CH WH 22

XN CHICAGO ILLS 845AM AUG 4 1930

E M ROBERTS

1209 WALNUT ST CHILLICOTHE MO

THIS IS THE CORRECT RECEIVED MESSAGE FORM USED BY THE POSTAL TELEGRAPH CABLE COMPANY SHOWING TIME AND DATE RECEIVED PLACED IN PROPER POSITION THIS FORM MUST BE OBSERVED BY ALL POSTAL OFFICES

L R THOMAS

855AM

1K WH 17

OMAHA NEBR 845A OCT 8 1928

E M ROBERTS

1209 WALNUT ST CHILLICOTHE MO

THIS IS THE STANDARD FORM FOR RECEIVED MESSAGES WHICH IS USED BY THE WESTERN UNION TELEGRAPH COMPANY

W T DAVIS

859A

LESSON XVIII.

STANDARD FORMS FOR RECEIVED MESSAGES AND EXPLANATIONS OF THE DIFFERENT CLASSES OF SERVICE

Messages received by Morse operators should be recorded in the following standard forms:

1. Full Rate Telegram.

10BU EN 10
CM BUFFALO NY 910A DEC 15 1916
CHAS H BROWN
214 DEARBORN ST ALBANY NY
BUY TEN CARS WHEAT FOR IMMEDIATE SHIPMENT TO BOSTON MASS
E C STONE
922A

In the above message, the letters "CM" preceeding Buffalo N Y, indicates that this message originated at the "CM" office in the city of Buffalo.

2. Collect Full Rate Telegram.

11BU EN 11 COLLECT
CM BUFFALO NY 910A DEC 15 1916
CHAS H BROWN
214 DEARBORN ST ALBANY NY
BUY TEN CARS WHEAT FOR IMMEDIATE SHIPMENT TO BOSTON MASS
E C STONE
922A

In the above message there are only ten chargeable words, the word "COLLECT" is counted but not charged for.

3. Day Letter.

12BU EN 20 DL
CM BUFFALO NY 910A DEC 15 1916
CHAS H BROWN
214 DEARBORN ST CHICAGO ILL
WE WILL WIRE FIVE HUNDRED DOLLARS TO YOUR CREDIT TO MEET BILLS DUE NEXT WEEK REMAIN CHICAGO FOUR DAYS LONGER
E C STONE
922A

The letters "DL" after the check indicates that this message is a day letter.

4. Night Message.

13BU EN 9 NM
CM BUFFALO NY DEC 15 1916
CHARLES H BROWN
214 DEARBORN ST CHICAGO ILL
ARRIVING SUNDAY NIGHT UNION STATION ARRANGED MEETING WITH ROBERTS
E C STONE
922P

The letters "NM" after the check indicates that this message is a Night Message. The student will note that there is no filing time placed on Night Messages.

5. Night Letter.

14NY EN 29 NL
W NEWYORK NY DEC 23 1918
E D REDFORD
YOUNGS HOTEL BOSTON MASS
NOTIFY JOHNSON KNITTING MILLS IMPOSSIBLE SHIP ORDER NUMBER SIX FIVE EIGHT EIGHT EARLIER THAN JANUARY 15 MAKING EVERY EFFORT TO RUSH MANUFACTURE OTHER ORDERS GOING FORWARD ON SCHEDULE
TOWNSEND MANUFACTURING CO
934P

The letters "NL" after the check indicates that this message is a Night Letter, there is no filing time placed on Night Letters.

6. Day Press.

15W HG COLLECT DPR
WASHINGTON DC 930A MAY 6 1918
TRIBUNE
NEWYORK NY
PRESIDENTS PROCLAMATION ANNOUNCING GOVERNMENT CONTROL OF RAILROADS ISSUED 9 AM. NEW DRAFT BILL SENT TO COMMITTEE.
JACKSON
937A

The letters "DPR" after the word "COLLECT" indicate that this is a Press Dispatch, and is sent Collect at Day Press Rates. The charges for Press Dispatches filed for transmission between the hours of 6 a. m. and 6 p. m. are: One third of what the tolls would be on the same messages at full commercial day rates at commercial count.

7. Night Press.

16W HG COLLECT NPR
WASHINGTON DC AUG 16 1918
TRIBUNE
CHICAGO ILL
TWO BARGES SUNK OFF VIRGINIA COAST. NO LIVES LOST.
JACKSON
830P

The letters "NPR" after the word "COLLECT" indicate that this is a Press Dispatch, and is sent Collect at Night Press Rates. The charges for Press Dispatches filed for transmission between the hours of 6 p. m. and 6 a. m. are: One-sixth of what the tolls would be on the same message at full commercial day rates at commercial count.

8. Government.

17NY BN 11 GOVT
W NEWYORK NY 930A AUG 10 1918
LIEUT J C KIETH
16 LINDELL ROAD BUFFALO NY
REPORT FOR DUTY AUG 15 CAMPDIX 63RD REIMENT
CAPT J P SMITH
936A

The letters "GOVT" after the check indicate that this is a Government message. Government Messages, except weather reports, are charged for at the rate of 40 per cent of what the tolls would be on a Commercial Message of the same class and length between the same points in the United States. The minimum charge for Government Messages are as follows: For a Day Message 25 cents, for a Night Message 20 cents, for a Night Letter 30 cents, and for a Day Letter 45 cents. Government Messages must be endorsed "Official Business" by the sender.

9. Money Transfer.

18BU FD 12
BUFFALO NY 215P JULY 21 1918
MOD
NEWYORK NY
FALSIFY JOHN BROWN 615 MEADOW ST NEWYORK
HAGGLE MARY BROWN
MOD
230P

Money Transfers are addressed to "MOD" (Money Order Dept.) and are signed "MOD" The word "FALSIFY" in the beginning of the body of this message will convey to the Transfer Agent at the Receiving Station, what means of identification the Payee will have to present to get the money. The code word "HAGGLE" is the word used for the amount of money which is being transferred. John Brown 615 Meadow Street, is the person who is to receive the money and Mary Brown is the person who is sending the money.

10. Deadhead.

19NY CE DH
FX NEWYORK NY JULY 18 1918
MISS DOROTHY SMITH
4280 KINGS HIGHWAY ST LOUIS MO
WILL ARRIVE SATURDAY 245 PM
ROBERT
10A

The letters "DH" after the receiving operator's personal sign indicate that this is a "Deadhead" message, or a "Free Message," and apply to messages sent under complimentary stamp franks, complimentary cards, directors franks and to company messages and employes free messages. A frank is a card issued to persons who are entitled to send messages free or at half rates. They are of four classes, viz.: Business Franks, Half Rate Franks, Complimentary Franks and Directors Franks.

11. Contract.

20NY EH CAK
FX NEWYORK NY 230P JULY 30 1918
AMALGAMATED STEEL CO
48 PARK ST PITTSBURGH PENN
SHIPMENT TWO CARS WATSON TURBINES DUE
PHILADELPHIA JUNE 5 BEING TRACED
CAMDEN EXPRESS CO
245P

The letters "CAK" after the receiving operator's personal sign indicate that this is a "CON-

TRACT" message. Such messages are sent under Business Franks and by Railroad Officials without Franks under special arrangements. They are sent free, but are charged by the General Auditor against the accounts of the Frank holders.

12. Service.

21DE EN SVC
MG CHICAGO ILL
YR R C JONES 1154 STATE ST NSN
DLY DETROIT MICH AUG 15 1918
830A

The letters "SVC" after the receiving operator's personal sign, indicate that this is a Service Message. A Service Message is one referring to some message which has been sent. They must be brief and sent only when absolutely necessary. The above Service Message is sent to the MG office at Chicago, Illinois, and conveys the following meaning: Your message to R C Jones 1154 State Street, there is no such street number here. This message is signed by the Delivery Department at Detroit, Michigan, on March the 15th.

The following abbreviations are used in Service Messages:

ADS.....Address
ADSD....Addressed
ANS.....Answer
CFN.....Confirmation
CHGS....Charges
CK.....Check
COLL....Collect
CY.....Copy
DLD.....Delivered
DLR.....Deliver
DSTN....Destination
DSTC....Deliver—ed subject to correction
DFS.....Disregard former service
ESTC....Erase subject to correction
DUP.....Duplicate
FLT.....Filing time
FM.....From
GBA.....Give better address
GSA.....Give some address
GQA.....Get quick answer
GNTEE...Guarantee

GNTEED.Guaranteed
HW.....Herewith
HA.....Hurry answer
LC.....Addressee said to have left city
MK.....Make
MSG.....Message
NH.....Not at home
NR.....No record
NSA.....No such address
NSN.....No such number
NSS.....No such street
OFS.....Office
OGNL....Original
OUR.....Our message of date
RDS.....Reads
REL.....Release
RP.....Reply prepaid
SVC.....Service
SG.....Signature
SGD.....Signed
UNDLD...Undelivered
UNKN....Unknown
WD.....Word
YR.....Your message date

The general form of service messages is likewise as condensed as possible, as they are not designed for delivery to patrons. They are transmitted as follows: Message number, Office call of sending office, Check "Svc," Office addressed, abbreviated body of mesage, the signature is; the office from, and followed by the date.

Note: The letters "XU" following the check of a Commercial message indicate that the sender requests an answer by wire. There is no charge for this service. The customer merely tells the receiving clerk when filing the Telegram, that he would like to have an answer by wire, this information is carried to the receiving office by the letters "XU" following the check. The receiving office will do their best to obtain an answer.

GRAIN PROVISION AND STOCK QUOTATION ABBREVIATIONS:

W—Wheat	P—Pork
C—Corn	L—Lard
O—Oats	SR—Short Ribs
R—Rye	

Option Months

F—January	K—May	U—September
G—February	M—June	V—October
H—March	N—July	X—November
J—April	Q—August	Z—December

Words and Phrases

N—Nominal
NB—None between
A, S (or) AX—Asked (or) Sellers
B—Bid (or) Buyers
PR (or) PFD—Preferred

The above abbreviations are used for quoting options on commodities by wire. If $1.59½ per bushel was being bid for wheat (to be delivered in March) the wire quotation would read: "WH 159½ "B," or if corn (to be deliverd in May) was being sold at $1.05½ per bushel the wire quotation would read: "CK 105½," etc.

Example of Grain CND as received at Chillicothe:

14KS ON CND
CHICAGO ILL FEB 23 1923
CND
CHILLICOTHE MO
WH 159½ K 161¾ N 147 A ½
CK 105½ N 106¼ A ½ U 108 B
ON 42¼ U 41¾
1130A
1142A

13. Wire.

22CH HG WIRE
JCW NY
1016A UNABLE MAKE 71 GOOD
KAV CHGO JULY 15 1918
1020A

The above is a Lineman message to the Wire Chief regarding wire troubles.

14. CND

23NY BD CND
NEWYORK NY JULY 15 1918
CND
HARTFORD CONN
STOX OR 90 ¼ EL 68 ½ US 93
1130A
1145A

The letters "CND" indicate that this is a Commercial News Department message. CND messages consist of Grain Quotations, Market Reports, etc. This service is charged for by the month according to the number of reports contracted for daily.

15. Weather.

24BU EN 11 WEA
CM BUFFALO NY 815A AUG 16 1918
OBSERVER
ALBANY NY
FAIR FRIDAY AND SATURDAY PROBABLY WARMER SUNDAY
KIETH
830A

The letters "WEA" after the check indicate that this is a Weather Bureau Report. The address body and signature are counted in a Weather Report message.

16. Full Rate Cable (Outbound to Cable Station).

25CH HG 9 CABLE
EX CHICAGO ILL AUG 4 1918
HAROLD BROWN
LONDON
ARRIVED CHICAGO ALL WELL
JOHN SMITH
1015A

The word "CABLE" after the check indicates that this is a Cable Message. Cable Messages are charged for by the word. Address body and signature are counted.

17. Full Rate Cable (Inbound From Cable Station).

26CO HG CABLE
LONDON 9 AUG 10 1918
JOHN SMITH
CHICAGO (ILL)
ARRIVED LONDON ALL WELL
HAROLD BROWN
1111P

The above is a Cable as received at Chicago. Note that the check is placed after the "Place From." The date is placed on this received Cable by the receiving operator at Chicago. The abbreviation for Illinois, in parenthesis is not counted or charged for in the check.

18. Deferred Cable (Outbound to Cable Station).

27CH EN 10 CABLE
EX CHICAGO ILL AUG 10 1918
LCO HAROLD BROWN
LONDON
ARRIVED CHICAGO ALL WELL
JOHN SMITH
1015A

The above is a "Deferred Cable." Deferred Cables are accepted at reduced rates to be transmitted when the cables are free of full paid traffic. They must bear the prefix LCO (language country of origin), LCD (language country of destination) or LCF (language country French), written before the address. In the above Deferred Cable we have the letters LCO, meaning language country origin. These letters LCO are counted and charged for as one word.

19. Cable Letter (Outbound to Cable Station).

28CH AH 10 CABLE
EX CHICAGO ILL AUG 19 1918
CLT HAROLD BROWN
LONDON
ARRIVED CHICAGO ALL WELL
JOHN SMITH
1015A

The above is a "Cable Letter." Cable letters are accepted at a still lower rate than the Deferred Cables. The rates are based on an initial charge covering a given number of words plus added charges for excess words. These messages are sent at the company's convenience and have a fixed time for delivery. The letters CLT preceding the address mean (cable letter telegraph) and signify the class of service. These letters CLT are charged for as one word. Read latest tariff applying to cable letters.

20. Week End Letter (Outbound to Cable Station).

29CH EN 10 CABLE
EX CHICAGO ILL AUG 19 1918
WLP HAROLD BROWN
LONDON
ARRIVED CHICAGO ALL WELL
JOHN SMITH
1015A

The above is a Week End Letter. These messages differ from Cable Letters only in the increased number of words included in the minimum charge and in time of delivery. Week End Letters may be filed at any time up to Midnight Saturday and are due for delivery the following Monday. The letters WLP (Week Letter Post) are charged for as one word and indicate the class of service.

21. Radio (Outbound Via Radio Station).

30BU CB 10 RADIO
BUFFALO NY AUG 19 1918
CHARLES EGBERT
ADRIATIC SIASCONSETT
SAILING OLYMPIC SATURDAY MARCH FOURTH
HARRIET
220P

The above is a Radio Message addressed to a ship at sea. These messages are first sent to a Radio Station and are then relayed by wireless to the ship. These messages are charged for by the word. The rate is first found to the Radio Station and the proper Water Rate is found and the two rates added together. The word RADIO after the check indicates the class of service. Adriatic in the address is the name of the ship on which Charles Egbert is sailing and Siasconsett is the name of the radio station through which this radio message must pass to reach the ship.

22. Radio (Inbound From Radio Station).

3ICO FN 9 RADIO SIASCONSETT USS WYOMING JUNE 15 1918
JOHN BROWN CHICAGO (ILL)
ARRIVE CHICAGO SUNDAY NIGHT HAROLD BROWN 230P

The above message is an example of a Radio Message as it is received at Chicago. This message is sent from a ship at sea to the Radio Station and then relayed on to Chicago. Note that the abbreviation "ILL" for Illinois is in parenthesis. The abbreviation for a state in the address is not charged for.

23. Marconi (Outbound).

32CH EB 9 MARCONI EX CHICAGO ILL FEB 22 1923
HAROLD BROWN LONDON
ARRIVED CHICAGO ALL WELL JOHN SMITH 1016A

The above is a wireless message to be sent across the ocean to a land station. Note that the above message form does not differ from the cable form except that the word Marconi appears after the check to designate the class of service.

24. Marconi (Inbound).

33CO JC MARCONI
LONDON 9 FEB 22 1923
JOHN SMITH
CHICAGO (ILL)
ARRIVED LONDON ALL WELL.
HAROLD BROWN
920A

The received form of Marconi does not differ from the received form of the cable except the word Marconi in the check. Marconis do not bear a filing time.

MESSAGES CONTAINING EXTRA WORDS AND THE FORWARDING OF MESSAGES

25. Message Containing Extra Words in Signature.

34CH PY 10 3 EXA
CHILLICOTHE MO 910A FEB 22 1923
B G JOHNSTON
2429 EUCLID AVE KANSAS CITY MO
WILL ARRIVE KANSAS CITY SATURDAY NIGHT FIVE FORTY
R B JACKSON
PRESIDENT STAR CO
916A

In the above message the three extra words "President Star Co" are counted as part of the 10 words signified in check. There are seven words in the body of the message and three Extra words in the signature, making ten words in all. The words 3 Exa after the check will convey the meaning to the Receiving Operator that there are 3 Extra words at some place in the message and to be on the look out for them.

26. Message Containing Extra Words in Heading.

35CH PY 10 2 EXA REPORT DELY
CHILLICOTHE MO 845A FEB 22 1923
HARDING ELECTRIC CO
KANSAS CITY MO
SEND FIRST CLASS ELECTRICIAN HERE EARLY TOMORROW MORNING
CHILLICOTHE ELECTRIC CO
900A

The words "Report Delivery" in heading are the two extra words in this message. When Kansas City delivers this message to Harding Electric Co., he will send a collect message to the Chillicothe Electric Co., informing him that his message to the Harding Electric Co., has been delivered.

27. Forwarding a Message.

36CH PY 13 3 EXA
ST LOUIS MO VIA CHILLICOTHE MO FEB 22 1923
JOHN BROWN
CARTHAGE MO
MEET ME NEXT MONDAY MORNING AT TEN OCLOCK
HOTEL BALTIMORE
H SMITH
1145A

In this message "ST. LOUIS MO VIA" are the 3 Extra words.

28.

37CH PY 15 5 EXA
ST LOUIS MO 22 VIA CHILLICOTHE MO FEB 23 1923
JOHN BROWN
CARTHAGE MO
MEET ME NEXT MONDAY MORNING AT TEN OCLOCK
HOTEL BALTIMORE
H SMITH
1145A

If the above message had been sent to Chillicothe on the 22nd and forwarded to Carthage on the 23rd the check would be 15 5 EXA. The words "STLOUIS MO 22 VIA" would be the 5 Extra.

29. Message Received Paid to be Forwarded Collect.

38CH PY 15 5 EXA 49
ST LOUIS MO 22 VIA CHILLICOTHE MO FEB 23 1923
JOHN BROWN
CARTHAGE MO
MEET ME NEXT MONDAY MORNING AT TEN OCLOCK
HOTEL BALTIMORE
H SMITH
1145A

The above message has been received a paid message and has been forwarded collect. The forwarding office has shown in the check of the forwarded message the tolls to be collected to cover its

24. Marconi (Inbound).

33CO JC MARCONI
LONDON ? FEB 22 1923
JOHN SMITH
CHICAGO (ILL)
ARRIVED LONDON ALL WELL.
HAROLD BROWN
920A

The received form of Marconi does not differ from the received form of the cable except the word Marconi in the check. Marconis do not bear a filing time.

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B G JOHNSTON
2429 EUCLID AVE KANSAS CITY MO
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916A

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CHILLICOTHE MO 845A FEB 22 1923
HARDING ELECTRIC CO
KANSAS CITY MO
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CHILLICOTHE ELECTRIC CO
900A

The words "Report Delivery" in heading are the two extra words in this message. When Kansas City delivers this message to Harding Electric Co., he will send a collect message to the Chillicothe Electric Co., informing him that his message to the Harding Electric Co., has been delivered.

27. Forwarding a Message.

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JOHN BROWN
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H SMITH
1145A

In this message "ST. LOUIS MO VIA" are the 3 Extra words.

28.

37CH PY 15 5 EXA
ST LOUIS MO 22 VIA CHILLICOTHE MO FEB 23 1923
JOHN BROWN
CARTHAGE MO
MEET ME NEXT MONDAY MORNING AT TEN OCLOCK
HOTEL BALTIMORE
H SMITH
1145A

If the above message had been sent to Chillicothe on the 22nd and forwarded to Carthage on the 23rd the check would be 15 5 EXA. The words "STLOUIS MO 22 VIA" would be the 5 Extra.

29. Message Received Paid to be Forwarded Collect.

38CH PY 15 5 EXA 49
ST LOUIS MO 22 VIA CHILLICOTHE MO FEB 23 1923
JOHN BROWN
CARTHAGE MO
MEET ME NEXT MONDAY MORNING AT TEN OCLOCK
HOTEL BALTIMORE
H SMITH
1145A

The above message has been received a paid message and has been forwarded collect. The forwarding office has shown in the check of the forwarded message the tolls to be collected to cover its

transmission from the Forwarding Office to the place which it was forwarded. The figures 49 after the 5 EXA represent the tolls on a 15 word message from Chillicothe, Missouri, to Carthage, Missouri.

30. Forwarding a Collect Message.

41CH PY 16 COLLECT 5 EXTRA 49 AND 42
ST LOUIS MO 22 VIA CHILLICOTHE MO FEB 23 1923
JOHN BROWN
CARTHAGE MO
MEET ME NEXT MONDAY MORNING AT TEN OCLOCK
HOTEL BALTIMORE
H SMITH
1145A

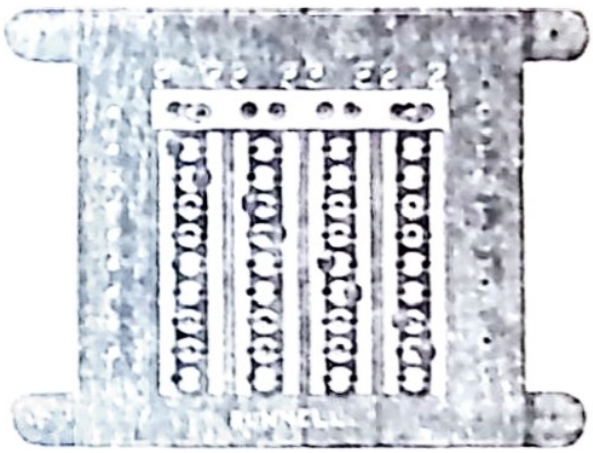
Explanation—In counting this check, there are ten words in the body of the message and the word Collect which is counted, but not charged for make eleven, then "St. Louis Mo 22 Via," the five extra make the check a total of 16 5 Extra. 49 cents are the forwarding charges from Chillicothe to Carthage, and 42 cents were the original Collect charges from St. Louis to Chillicothe. The Manager at Carthage will collect from John Brown 91 cents.

LESSON XIX.

THE MAIN LINE CIRCUIT

INSTRUMENTS EMPLOYED IN THE MAIN LINE CIRCUIT

The instruments which are installed in the ordinary telegraph office for use on the main line circuit are the switchboard, the key, the relay, the sounder and two gravity batteries, or wet cells as they are commonly called.



The Switchboard

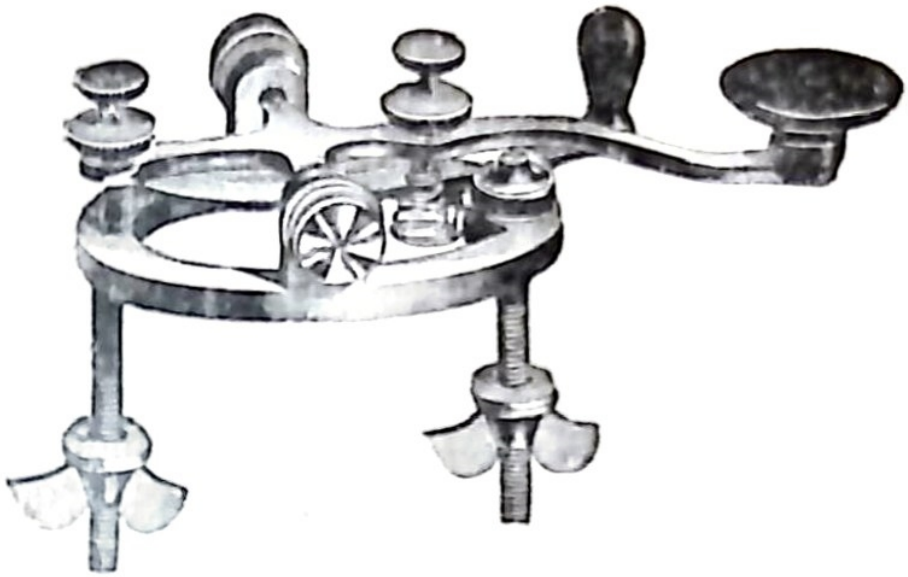
The switchboard is used for the purpose of connecting the main line wires with the instruments. The pin plug type of switchboard, shown in the accompanying illustration, is the one most commonly used. On the front of the pin plug switchboard for intermediate offices, are two perpendicular bars for each wire.

If a wire which runs past an office is to be connected with the office, the wire is cut and the two ends are brought into the office and connected to the perpendicular bars by means of binding posts at the top of the switchboard. Between these per-

pendicular bars are a row of discs which are connected horizontally with each other on the rear of the board by a metal strap, with the exception of the bottom row. Each horizontal strap is also connected with a binding post at the left of the board to receive the instrument wires. Each disc and each perpendicular bar has a semi-circular hole in its edge so that a metallic plug may be inserted which will connect the perpendicular bar and the horizontal strap on the back of the board. The ground wire is connected with the top row of discs which are covered by a metallic plate known as the lightning arrester. The lightning arrester and the perpendicular bars have no connection, space enough is allowed for a sheet of writing paper to play freely between them.

The Ground Wire

Every office is supplied with a ground wire which consists of a wire which is first connected to the binding post opposite the top row of discs which are covered by the lightning arrester and then to a rod driven several feet into the ground, or to a gas or water pipe, the latter being preferable. The rod or water pipe should be filed or scraped bright and clean for several inches and insulated copper wire (with the insulation removed where it is to be attached to the rod) wound evenly around the rod several times and soldered. Only the terminal ground wires are always in use on the line; the use of ground wires at intermediate offices are for testing purposes. The intermediate office upon inserting a plug in the ground wire hole in the switchboard will divide the line into two independent circuits. There must be a main line battery at each terminus in order that the two circuits may work on either side

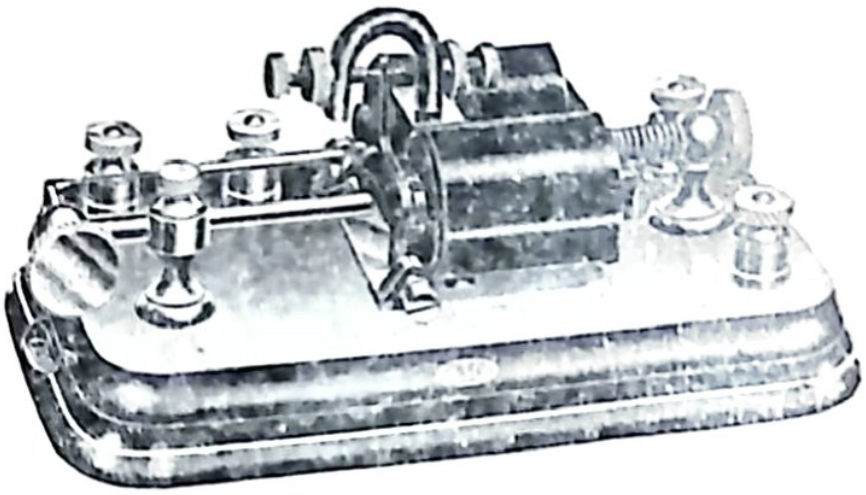


The Key

The key is a mechanical device for opening and closing the circuit. The principal features of the key are: A metallic lever on a trunion, supported by screws, in the elevated sides of a metalic base. On the bottom of this base are two metallic screw posts to receive the ends of the wires. One post is separated from the other by non-conducting material — generally vulcanized rubber — which runs around the top of the front leg of the key. In the center of this is fastened a small piece of platinum, and directly above this on the under side of the key lever is fixed another piece of the same metal. One being insulated from the other, the current cannot pass between them except when the lever is pressed down, bringing together the two platinum points which are really the two ends of the wire. A spring is employed under the key lever to keep these two points separated. The circuit is kept closed by a circuit closer or removable bar, which slides under a lip, thus keeping the wire electrically connected when not in use.

Adjustment of the Key

The movement of the key should always be free; that is, do not have the side screws tight enough to bind the lever and not enough of the reverse movement to allow it to play with a side movement, see that the platinum point in the key lever strikes the lower point in the front leg squarely on top and keep both points free from rust and dirt. The distance between the two points should be equal to the thickness of about five pieces of ordinary writing paper; this distance is regulated by the screw in the end of the lever. The spring should be strong enough to separate the two platinum points readily but will vary with the person using the key. The writer recommends a pretty strong spring for the beginner as this helps to develop the wrist movement.



The Relay

The relay is connected with both the main line and the local circuits. Its chief use is for resistance. It has a bar or armature so arranged as to be free

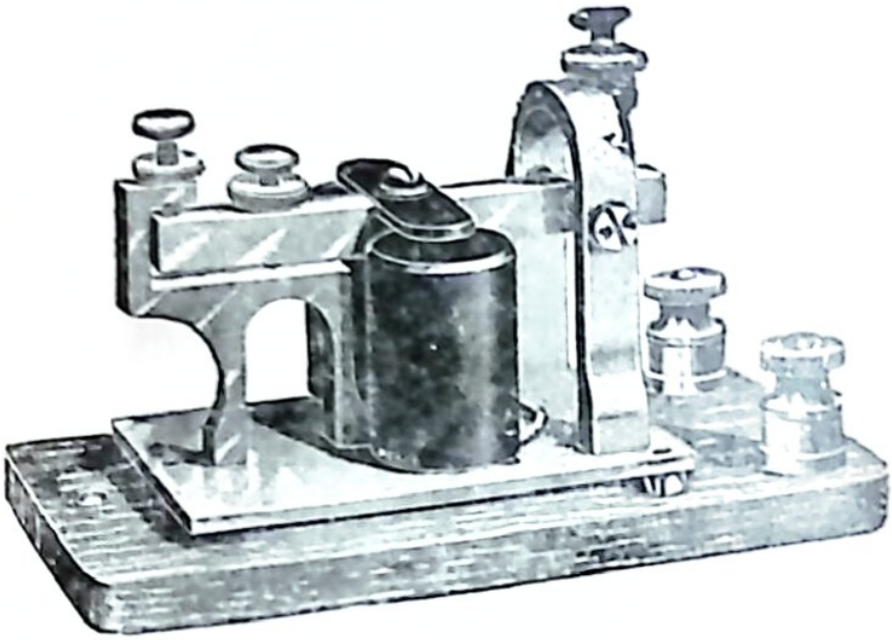
to move when acted upon by its electro magnets and which, when moved, opens and closes the local battery circuit and the sounder, which is also connected through the relay. It has two electro magnets horizontally arranged and four binding posts. The two binding posts at the end being connected with the electro magnets and known as the main line binding posts, while the remaining two, situated at the side and end, are known as the local binding posts, being connected with the armature and the frame, or yoke over the electro magnets and armature.

Adjustment of the Relay

The relay is the most difficult of ordinary telegraph instruments to adjust. In most relays the magnet itself can be moved backward and forward, thus adjusting its position in front of the armature according to the strength of the current. A strong current requires that the magnet be drawn farther away from the armature, and a weak current the reverse. The magnet should never be brought close enough to the armature to prevent the two platinum points striking firmly. It is necessary that the armature be upright and that the two platinum points strike each other squarely. These points should be kept free from dirt. The play between these points should be from one to three sixteenths of an inch. In wet or damp weather, especially during storms, variations in currents occur when the line is not perfectly insulated, and the spring requires very careful adjustment. It should be tightened enough to draw the armature away from the magnet when the magnet is demagnetized. The spring adjustment is known as high and low adjustment. A strong current requires a tightening of the spring or a high adjustment, and a weak current the reverse.

The Sounder

The sounder is the instrument employed in receiving the characters which are formed by opening and closing the local circuit through the relay. It consists of two upright electro magnets, an iron armature attached to a movable lever fixed upon a frame elevated above the base and a spring attached to the lever which must be adjusted in proportion to the strength of the batteries. It is regulated by two adjusting screws, one stopping the movements toward the magnets which gives the sound, the other limiting the movement of the lever away from the magnets by the spring.



Adjustment of the Sounder

The adjustment of the sounder is similar to that of the relay, only the local circuit attached is not subject to change on account of weather conditions and the armature always remains the same distance from the magnets; it should be as close to the magnets as possible without actually touching it. The play of the lever to and from the magnet depends upon the strength of the current attached, a strong

current will admit more play than a weak one, this play however, can be too great to give clearness; the spring should be strong enough to draw the lever away from the magnet with all force possible and still allow the lever to work freely.

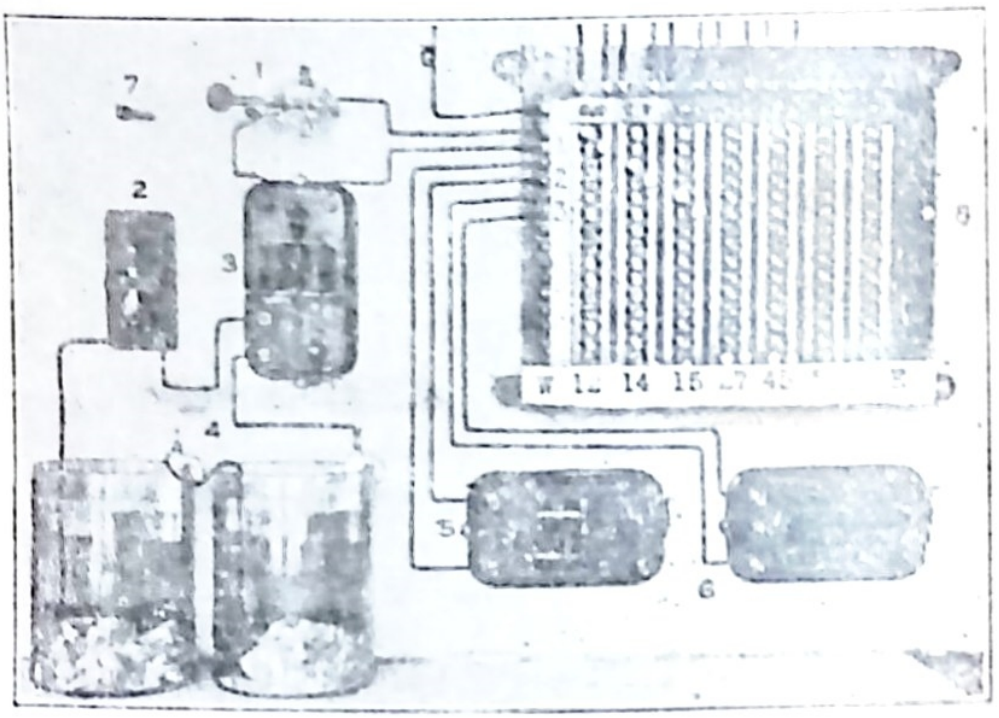
Batteries

Gravity, or wet cells as they are commonly called are the type of battery generally used for local sounder current. A gravity battery consists of

a glass jar, a zinc, a copper and about eight or ten ounces of blue vitrol, or sulphate of copper.

To set up a gravity cell, place the copper plate with leaves unfolded in the bottom of the jar and carry the insulated copper wire to which the plate is attached upward and out at the top of the jar; put in about eight ounces of the blue vitrol distributed evenly about the leaves of the copper, fill the jar with clear water to about one and one-half inches from the top, then hang the zinc inside the jar suspended from the top edge of the jar. The water should then be about one and one-half inches above the zinc. A battery when first prepared will not function for some days. To hasten its action it is well to short circuit it for about forty-eight hours. To accomplish this merely attach the copper wire leading from the copper to the binding post in the top of the zinc.

About every two or three months the battery should be thoroughly overhauled and cleaned. The zinc and the copper should be taken out and washed, the clear liquid should be poured into a clean glass or earthenware vessel and the dirt which has accumulated by the decomposition of the zinc plate thrown out, and the jar washed. Arrange the battery as before adding blue vitrol and pouring in the clean liquid that you took out of the battery and adding enough water to make the battery complete. The use of the clean liquid saved when cleaning will help give the battery strength.



The Main Line Circuit

The above cut represents a complete set of main line instruments as they are arranged in the ordinary telegraph office. At 8, is a seven line switchboard, at 7, is one of the metallic plugs which are used in plugging in the various circuits, and at 1, 2, 3, 4, 5 and 6, various instruments are arranged to

represent a station equipment. A complete set of instruments consist of a sending key, a relay and a sounder. The instruments numbered 1, 2, 3 represent a complete set, and with placing two cells of battery in the circuit between the relay and sounder, as shown at 4, are properly set up. At 1 is the key; at 3 the relay and at 2 the sounder. Other relays numbered 5 and 6 respectively are shown without sending keys and sounders.

At the bottom of the switchboard, W, stands for West. The numerals 12, 14, 15, 27 and 45 represent the numbers of the various wires, or circuits which enter the switchboard, and the letter E at the right stands for East. At the left of the board toward the top, the numerals 1, 2 and 3 represent the numbers of the instrument sets. The wire G at the upper left of the board is the ground wire.

Note the manner in which the various sets are plugged in. Wire No. 12 is cut in on instrument set No. 1, or the complete set of instruments. Wires No. 14 and 15 are plugged in on relays 5 and 6 respectively, while wires No. 27 and 45 are cut through at the bottom of the board, in other words, wires No. 27 and 45 are not cut in on instrument sets but are connected through.

If the student will study the above diagram carefully, he will have no trouble in understanding the arrangement of the instruments in the main line circuit.

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[illegible] PRINTING CO., ST. JOSEPH, MO